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RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., } Editors.

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Cable address: "Rothwell," New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus *; and only for articles so signed is he responsible.

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THE mixture of coke with anthracite in the blast-furnace, which has become so popular among furnace managers, and which it is claimed has greatly increased the output of the furnace, has apparently been overvalued.

The Glendon furnaces, under Mr. F. FIRMSTONE, are certainly provided with the highest skill in the profession, as their exceptional success has demonstrated. Every change made there consequently carries great weight.

While we do not understand that Mr. FIRMSTONE in any way condemns the use of coke and in fact, 25 per cent of his fuel charge is now Connellsville coke, we are informed that he proposes in the near future returning to the use of anthracite exclusively.

The Glendon iron has a deservedly high reputation, and is one of the brands that sells above the "Standard Lehigh irons," and no decline in quality would be permitted.

That the very highest quality of iron is as attainable with anthracite alone as with anthracite and coke, is well known; in fact, the Crane Company's "Castle" brand, which is used almost exclusively for open-hearth steel-making, being made principally from foreign ores carrying a very low percentage of phosphorus, and which sells at $20@$21 at the furnace, is made with anthracite exclusively. The remarkable quality of this iron is due to the care with which both fuel and ore are selected, and not to any lessened output; for this has reached the magnificent weekly figure of about 580 tons to the 60 by 15-foot furnace, with a consumption of fuel that would be considered excellent practice in a coke-furnace.

This reversion to anthracite is significant, and not less so is the comparatively low-blast temperature used in many of the furnaces; from 900 to 1000 or 1100 degrees is the temperature at Glendon, Crane, Durham, Warwick, and other important works. The pressure of blast appears also to be tending downward, though the volume is, of course, increased, as the increased make of iron indicates.

The Cooper iron stoves, introduced so successfully at Durham by Mr. FACKENTHAL, are being adopted at a number of the Eastern furnaces, and appear to be replacing in some cases the fire-brick stoves.

These straws indicate a somewhat unexpected direction to the current of progress in iron smelting that will well repay thoughtful attention.

A FLYING visit to extensive works in company with a hundred or more persons is not always the best way in which points of great professional interest can be examined. Nevertheless, the opportunity that such circumstances afford for gaining and comparing the experience of many experts sometimes more than compensates for the disadvantages.

Without entering at this time into any detailed description of the furnaces and rolling-mills visited by the members of the Institute of Mining Engineers at the Bethlehem meeting this week, we will notice, in the brief manner in which they were noted, a few points that may have a wide interest.

SOME NOVEL FEATURES IN THE NEW ROLLING-MILL OF THE BETHLEHEM COMPANY.

The new roll train now being completed is intended to roll shapes and structural iron as well as rails in lengths of 120 feet if necessary. It is of the Fritz-American type of three-high rolls, and the weight of the center roll is balanced by spiral steel springs instead of in the old-fashioned way—a much simpler and less expensive arrangement.

The rolls are short, and each has its own roller table. The rail or other bar being rolled is lifted from one table to the next, a distance of about six feet, by means of arms worked from a shaft running midway between the tables, and a hook attachment on the end of the arm prevents the bar from falling off the arm as it comes down to the second table. This arrangement is very simple and effective, and allows of a very rapid transfer of the bar from one set of rolls to the other, thus allowing the bar to be rolled down much more in a single heat, while allowing the use of short rolls.

The rolls on the tables are run by means of three bevel cone friction-wheels to each roll, one being, of course, on the roller axis. The shaft that carries the driving cones is moved endways by means of a hydraulic cylinder at the end; and by the movement of the entire shaft, reverses the whole set of rollers.

It will be possible in this mill to roll very long lengths of structural and bridge bars, a great advantage in many cases.

The mill is provided with a very ingenious arrangement for sawing rails and beams obliquely. It is said that rails with a scarf end have been found on the Lehigh Valley Railroad much more durable than the usual square-cut ends. The saw for cutting obliquely is, with the steam cylinder for running it, on a frame pivoted near the saw, so that it can be turned to cut the rail at any angle up to 45 degrees. The wheel of the car does not hammer such a rail as it does the square end. Mr. ROBERT SAYER is the inventor of this device, and Mr. FRITZ designed the saw arrangement for cutting it.

The plant bears evidence, we need hardly say, of the remarkable mechanical skill and ingenuity of its designer, Mr. JOHN FRITZ, and it of course embodies the teachings of his vast experience.

Though still the tremendous worker, Mr. FRITZ has at last somewhat shortened his "shift." For though he has not joined the eight-hour

movement himself, he no longer makes "time and half-time" continuously, as he had done for thirty years at a stretch.

To Mr. FRITZ more than to any other living engineer does American steel manufacture owe its wonderful progress, and the conservation of his health and strength is a matter in which the entire profession is interested. Let us hope that Mr. FRITZ will apply some of the lessons of his vast experience on the effect of overstraining the other materials he works with to that more subtle material, the basis of mental and physical strength.

It is just as easy by overwork to pass "the limit of elasticity" in this as in overworking one of his own rolling-mill engines, and the "permanent set" that follows loading beyond the mental limit of elasticity can never be altogether removed by any method of subsequent annealing or tempering.

IN the very interesting discussion on Mr. BIRKINBINE'S paper on the Warwick Furnace (see ENGINEERING AND MINING JOURNAL, February 20th, 1886), Mr. J. E. JOHNSON, Superintendent of the Longdale (Va.) furnace, gave the following very interesting information.

This furnace has always had the reputation of being one of the most economical in this country in the consumption of fuel, and a record of 17 cwt. 5 lbs. coke to the ton of pig-iron is wonderful, even if now "old history," as Mr. JOHNSON says, and it is worthy of a place in the archives of the industry, that is, in these pages.

THE RECORD OF THE LONGDALE FURNACE.

I give you below some results obtained at our No. 1 Furnace, in 1879, now seven years ago. The resurrection of this "ancient history" would seem to show that a low consumption of coke is as obtainable with iron stoves as with the fire-brick ones.

As the results of a long period are more apt to give a correct showing than those covering a mere "spurt," I have selected the figures for the whole of our blast No. 8, or, as we call it, "the blast of 1879."

The furnace is as follows: Hight, 60 feet; diameter bosh, 11 feet; tunnel head, 8 feet; hearth, 6 feet; three tuyeres, 3700 cubic feet blast per minute.

This blast, which covered a period of 67 weeks, was begun in the latter part of 1878, and ended in the month of February, 1880.

The fuel used was New River coke from our mines and ovens at Sewell, West Virginia, and the ores, brown hematite, from our mines on the Longdale property, four miles from the furnaces.

During this blast of 67 weeks, we consumed 12,013 tons of coke and produced 12,063 tons of iron, these figures including 27½ tons of castings. Most of the iron produced being sold west of the Alleghanies, our tons contain 2268 pounds, a ton of coke weighing 2240, as is customary.

The average grade of the iron was 3·28; the ore used showed a yield of 46·7 per cent. The limestone charged averaged under 10 cwt. per ton of iron, the actual figures being 9·26 cwt. per ton of iron made.

The best work done by way of a "spurt"—without any intention of spurting on our part—was during one continuous period of 12 weeks, covering most of the spring of 1879. In these 12 weeks, we made 2583 tons of pig with 2284¾ tons of coke, an average of 2268 pounds of iron to 2000 pounds of coke. One week in this period the record stood:

	Tons.
Pig made	219½
Coke used	187

or one ton of pig to every 17 cwt. and 5 pounds of coke consumed.

The stoves were planned by Mr. H. Firmstone, and contain 36 upright pipes upon four bed-pipes, giving four rows.

The pattern of these pipes was got up by Mr. Firmstone and Dr. Palmer, formerly Superintendent of the Musconetcong Iron-Works, Stanhope, New Jersey; their design being to get the largest possible amount of heating surface out of the material used by means of the section adopted.

The combustion-chamber is at one end of the oven, and is of the same vertical section as that inclosing the pipes and separated from it by a partition wall, openings through the bottom of which allow the heated "products of combustion" to pass into the pipe chamber.

The end sought to be attained was the entire combustion of the gases within the space allotted for that purpose, and in practice the idea has been fairly well carried out, only the pipes in the first row being injured by the burning gases so as to require renewal.

I may say that it is now ten years since the one of these stoves that has been principally used was built. Within this time, the first row has been renewed only three times. The other three rows are perfectly serviceable after being in almost constant use during this time, and are apparently good for at least as many years to come. The blast is taken from the stoves at the "hot end."

The heat obtained at the tuyeres was nominally 800 degrees, as shown by one of E. Brown's portable pyrometers; but it was, and is, a rare occurrence for us to be able to melt zinc at a plug-hole.

I trust that the statements and figures may be of some value in upholding the iron stove side of the controversy.

Paper Pipes.—In Vienna, there were recently exhibited gas and water service pipes made of paper. The same kind of pipes will do for many factory purposes, and for laying electrical wires. The pipes are made as follows: Strips of paper are taken, the width of which corresponds with the length of one pipe section. The paper is drawn through melted asphalt, and wound upon a mandrel that determines the inner diameter of the pipe. When the pipe thus made has cooled, it is pulled off the mandrel, and the inside is covered with a kind of enamel, whose nature is kept secret by the makers. The outside is painted with asphalt varnish, and dusted over with sand. It is stated that such a pipe will resist some 2000 pounds internal pressure, though the thickness of the stuff is only about half an inch. This might be a good thing for hydraulic pipes out in the Western mining regions.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

The Geological Survey of Brazil.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: During the past year, I have heard of more than one of our leading instrument-makers having received or filled orders for engineering instruments for "The Geological Survey of Brazil." I have reasons for suspecting that these houses are imposed upon in some way, and a few days ago I took the liberty of writing to one of them to this effect. For wider distribution, I give you here the reasons for my suspicion.

There is no such organization as "The Geological Survey of Brazil," and there has not been since 1878. The "Commissao Geologica do Imperio do Brazil," or what we should call the Imperial Geological Survey of Brazil, was organized in 1875 under the direction of my friend and teacher, Prof. Charles Frederick Hartt. In 1878, the Brazilian government suspended the survey, and the collections we had made were turned over to the Museu Nacional in Rio de Janeiro, where most of them now are, and one of the members of the extinct survey was employed by the government to look after them.

No one acquainted with the financial and political condition of that empire would dream of the possibility of the government being induced to carry on a general geological survey of the country at present or in the near future. I know, too, as a matter of fact, that no such organization exists or has existed since the suspension of the Commissao Geologica in 1878. I am thus positive upon this subject, because I was assistant geologist of the original Commissao Geologica during its existence, have lived and traveled in that country for nearly eight years, and am in constant communication with persons living there, and especially with those interested in scientific work. The date of my last mail from Rio de Janeiro is April 15th.

The only organizations in that country that can have any shadow of a claim to the title of geological surveys are the little exploring parties that are sometimes sent out by the provincial governments to examine and report upon some of the little traveled parts of a province, and their availability for agricultural purposes. But of course, such parties have no claim whatever to the title of "The Geological Survey of Brazil."

To parties receiving orders purporting to come from "The Geological Survey of Brazil," I should simply say: Be sure to get the money for your goods before the goods are delivered. JOHN C. BRANNER.

GEOLOGICAL LABORATORY, INDIANA UNIVERSITY, BLOOMINGTON, IND.

Butte Notes.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The rumor of the Alice purchase of the Rising Star was premature, as no doubt you have heard from some of your other correspondents.

The Alice management has sometimes been severely criticised, but it is only another example of misplaced criticism.

Stockholders should put the blame where it belongs—on the directors who control the company. It is a well-known fact that the superintendent of the Alice mine, Mr. Hall, who has been in the employ of the company for the past seven years, is one of the most efficient and economical managers in this camp. He thoroughly understands both the business and scientific part of his duties, and is considered an excellent miner. Credit to whom credit is due.

At annual meetings of stockholders, as a rule, managers and superintendents are made the scapegoats for the sins and mistakes, or worse, of the directors.

Superintendents are not always independent enough or even in a position to refute such statements, nor are they always made acquainted with such proceedings.

As long as directors of mining and smelting companies who lack any knowledge of the first principles of metallurgy assume to manage a plant from a desk in New York or other city hundreds or thousands of miles distant from the plant, the superintendent, though unwillingly, must obey or—quit. Striking instances of this kind of management occur daily at some of our copper companies. Let stockholders put the blame where it belongs.

The condition of the copper mines remains unchanged since my last letter.

The strike of the brakemen on the Union Pacific system lasted only a week, and the total loss of production does not exceed 1,000,000 pounds of fine copper. It taught a lesson to some concerns, and they will in future keep their plants supplied with a stock of ore, especially those that obtain ore by railroad; the smelters will keep a reasonable supply of coal and coke, and the silver mills a supply of salt.

The Parrot Company sold a quantity of its black copper East, for export, and so much less is going to be refined at Bridgeport, Conn.

If this company does not soon provide for developing its mine, in no distant time its plant will be without ore to smelt. The ore reserves at the mine are diminishing at a rapid rate.

The Montana Copper Company's furnaces are still idle, notwithstanding the enormous ore-bodies in sight at the Colusa and Liquidator.

This company owns considerable property all around the camp, and it has just sold two mines for $85,000 to R. C. Chambers, Salt Lake. These mines are situated about three miles from its main mine and plant; the Green Mountain, 800 feet long by 100 feet wide, and the Gambler, 1500 feet by 500 feet, were purchased, the former six years ago, it is said, for $12,500, the latter three years ago, for about $1500, by Manager Raunheim. The company consequently clears about $70,000 by this operation.

The Mountain Chief mine is sinking another hundred feet, and meantime but little ore is taken out.

W. A. Clark works the Colusa Fraction, his part of the East Gambetta, and the Mountain Chief. His manganese ores assay well in silver. He proposes not to make more than 500,000 pounds of fine copper per month.

The rumors about a sale of the Mountain View are without foundation, so far. The Anaconda does its regular work.

The Chambers & Daly group continues to explore thoroughly its various mines, such as the Modoc, Mat & Adelaide, Diamond, Wake-Up Jim, Wild Bill, etc.

Rumors that can not be traced to any reliable source say these groups are working as agents for the Anaconda owners. However, there is probably some truth in these statements. NICK.

QUANTITATIVE CHEMICAL ANALYSIS BY ELECTROLYSIS.*

By Thomas Moore, Erdington.

The electrolytic method of separating and estimating metals is now so very generally employed that I venture to think the following details of some of the more important processes by myself will be useful to those chemists who practice this method of analysis.

Iron.—To the distinctly acid solution of the ferric sulphate or chloride add a solution of glacial phosphoric acid (containing 15 per cent of the glacial acid), until the yellow color completely disappears (in presence of only small quantities of free acid a white gelatinous precipitate appears, which, however, dissolves in the after process); then add a large excess of ammonic carbonate, and gently warm until a clear solution is obtained. On electrolyzing the hot (70 degrees C.) solution by a current equal to 1200 c. c. mixed gases per hour, the iron is rapidly and completely deposited at the rate of about 0·75 grm. per hour; the end of the decomposition is recognized by testing a portion of the solution with ammonic sulphide. Potassic sulphocyanide gives no reaction in presence of phosphoric acid. Aluminium, chromium, and manganese also give a clear solution by the above treatment, but no deposition; the two latter, however, may be precipitated from the remaining solution by sodic sulphide (the ammonic salt having no effect), first, of course, reducing the chromium that has been converted into a chromate by the current.

Cobalt and Nickel, treated as above, give excellent solutions for complete electrolytic deposition when used either hot or cold. If chromium is present, the deposition has a remarkably brilliant appearance, which is quite characteristic.

Zinc, submitted to the same treatment, gives a clear solution, from which a current equal to from 100 to 300 c. c. mixed gases per hour readily deposits the metal as a shining, coherent coating, which may be washed, dried, etc., without fear of oxidation. If excess of ammonic carbonate is added to a solution prepared by precipitating the solution by sodic phosphate, and dissolving this precipitate in potassic cyanide, a solution is obtained, which, when electrolyzed hot (80 degrees C.), gives an exceedingly rapid and complete deposit. A current equal to 1000 c. c. mixed gases per hour is used. Zinc (also Ni and Co, and to a certain extent Fe) may also be quantitatively separated from its glacial phosphoric acid solution by a current equal to 1300 c. c. mixed gases per hour. Zinc is best deposited on a silver-plated electrode, since it is very difficult to dissolve the whole of it off a platinum one, even by boiling concentrated acids.

Iron, Cobalt, Nickel, Zinc.—When a solution containing the four metals is treated with phosphoric acid and ammonic carbonate, and then electrolyzed, the whole of them are completely deposited. Cr, if present, forms a soluble chromate, Mn is partially deposited as oxide on the opposite electrode, Al remains unaltered.

Manganese.—In all cases, it is better to estimate this metal as oxide by deposition on the positive electrode, using slightly acid solution of the nitrate or sulphate: it is, however, interesting to note that a very large proportion of the metal may be successfully deposited as such by employing a neutral solution containing a large excess of ammonic sulphocyanide. A powerful current is necessary.

Copper, when met with in the course of analysis as recently precipitated sulphide, should be dissolved in potassic cyanide, and the warm (70 degrees C.) solution, after addition of excess of ammonic carbonate, electrolytically decomposed. The deposition is exceedingly rapid and perfect.

Cadmium.—The electrolytic estimation of this metal is very similar to that of zinc, and may be successfully deposited from any of the solutions given for that metal. A weak current (40 c.c. mixed gases) readily deposits all metal from its glacial phosphoric acid solution, while zinc under similar conditions gives no deposit whatever.

Bismuth.—As is well known, the difficulty of obtaining a good deposition of bismuth is considerable; but by carefully attending to the following instructions, really good and reliable deposits may be obtained: Add sufficient tartaric acid to prevent the precipitation of a basic salt; then, after rendering the solution slightly alkaline with ammonia, add a considerable excess of glacial phosphoric acid, so that the solution has a strong acid reaction. The solution so prepared is first decomposed by a weak current (from 20 to 30 c. c. per hour); but as the decomposition proceeds, a much stronger one may be employed (450 c.c. per hour). The deposit, which at first appears as a loose powdery film, gradually assumes a metallic luster, and becomes exceedingly hard and compact.

Tin is easily deposited, either from its acid or alkaline glacial phosphoric acid solution.

Arsenic.—An attempt to estimate As as AsH_3, by electrolyzing its acid solution in presence of a large quantity of zinc sulphate, catching the AsH_3 in U-tubes containing $AgNO_3$, getting rid of excess of silver by HCl, and titrating the As_2O_3 in the filtrate with iodine and starch, gave only approximate results.

Medal for Water-Gas Improvements.—The board of judges appointed by the Franklin Institute, of Philadelphia, Pa., after an exhaustive examination of the state of the art, have recommended the "Grand Medal of Honor in favor of Thaddeus S. C. Lowe, of Norristown, Pa., for his substantial improvements in the manufacture of water-gas, and for his numerous improvements in methods and appliances for the utilization of water-gas as a fuel for domestic and industrial purposes, and as an illuminating agent."

* *Chemical News.*

THE BETHLEHEM MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The Bethlehem meeting of the Institute of Mining Engineers has been successful, though not remarkable in any respect. The attendance of members was not as large as at the Pittsburg or the Nova Scotia meeting, and the attendance of ladies was smaller than in the usual summer sessions. About 100 members were in attendance.

The members were welcomed to Bethlehem by the Burgess, Mr. George H. Myers, in an eloquent address, which was appropriately responded to by the President of the Institute, Prof. R. H. Richards, of the Massachusetts Institute of Technology.

President Richard then delivered a very interesting inaugural address on the subject of American Mining Schools, of which the following is a very full abstract:

AMERICAN MINING SCHOOLS.

The president began his address by reference to the introduction of mining schools in this country and the series of discussions thus occasioned. He defined the term engineer and related a very good anecdote of a young machinist's first experience in mining engineering. An engineer may or may not be a graduate of a school, because this inborn faculty will find its way out if the circumstances and opportunities are favorable. Then, it may be asked: "Why have engineering schools at all? Why not let the opportunity make the man?" Dr. Drown has answered: "A technical school is a device to save time. Man's days are still threescore years and ten, but he now crowds as much into them as Methuselah did into his nine hundred and sixty and nine." A man without school education may make a remarkable engineer; but it may have taken him many years to get his training, and at the end of the time there may be whole regions of knowledge utterly unknown to him. In other words, he is liable to be a one-sided man, without a broad outlook upon other fields than his own. A school man, on the other hand, goes through a systematic training, in the course of a few years at school, during which time he makes excursions, as it were, into the more important departments of knowledge, while he has been steadily pursuing one to the utmost of his ability. The school can not teach him every thing, to be sure, but it can give him the keys to the storehouses that he may need to draw from in after-life. The school training, if it is a good one, helps him to learn new and better methods, and makes it possible for him to become an experienced engineer much sooner than he otherwise would do.

We might say further that a technical school that has a good course of practical training along with its regular school work is a device to save the employers time and trouble in training young men to suit them. But, of course, the school must aim to send men who will suit the works, and it is just here that the Institute of Mining Engineers, composed as it is of both classes, can act as a medium of communication; for we of the schools must know what the works demand, and the managers must know whom we have to offer.

Mining schools have amply proved the necessity for their existence; nevertheless, there is a danger to be guarded against, that is, lest they make it their chief aim to prepare purely theoretical men, for whom there is but little demand. Professor Thompson reported that the English commissioners found in Germany an excess of one thousand well-trained polytechnic graduates over the demand, and they were informed that the manager of a large engineering works had been so importuned by these young men for employment that he put up in his window a notice, "No polytechnic student need apply." The Austrian minister of instruction also told Professor Thompson that "the most serious problem in education in that country is to reduce the number of theoretical engineers, who, after their long course of study, found themselves not wanted, and to increase the number of men in whose training theory and practice had been so combined that they could meet the great demand for those who can put theory and practice together." That stage has not yet been reached in our country, and it is to plead for such a thorough understanding between the works and the schools that we may forestall such a condition of things here that this paper has been written.

It is a pertinent inquiry just here, What ought the schools to try to give the embryo engineer? We may perhaps state it thus: The school should develop the scientific habit of mind, the spirit of the true investigator, or, to put it in terse English, should teach him what he wants, where he is to get it, and how he is to make the most efficient use of it. This lesson is not to be taught once or twice only, but should come into every day's work. An engineer so taught can and will easily educate himself in after-life.

Dr. Egleston has said, "The training of the school should be such as to teach the young engineer how to acquire not only judgment, but, as far as possible, an independent one. This I believe to be one of the distinguishing characteristics of American technical education."

A mining engineer is frequently called upon to sit in judgment upon important questions. He occupies a place in the community somewhat similar to the chemist's analytical balance or the market hay-scales. Now, if a standard hay-scale does not give correct weight, what is done with it? Why it is thrown into the pile of scrap-iron and another scale is purchased, but the purchaser this time is most likely to try another dealer. So it is oftentimes with men. If an engineer undertakes an investigation, and through carelessness, through insufficient examination, or because he has undertaken something for which he has never qualified himself, makes a serious error in judgment, he is not only thrown overboard himself, but his former employer will in all probability look for a graduate of some other school the next time he wants help. The failure not only follows him for years, but follows his school also.

But after all that the school can do, the remark of Capt. Douglas Galton holds true: "However much education you may give a young man, you can at most only teach him how to learn; the real education is what he gives himself after he leaves his instructors. It will always depend upon the young man himself whether he makes an engineer or not."

In order to start the young man on this road with as little delay as possible, it is necessary that the training in the school should be practical as well as theoretical.

The central question in the discussions of ten years ago to which the

opening address of Holley gave the key-note, was: At what period shall the student take his practice? Before he enters the technical school? While he is in it? Or after he leaves it?

Prof. Lewis M. Haupt, in his review of these various opinions, states that eight of the engineers who took part in the discussion were inclined to favor the first arrangement, twelve the second, and eight the last, giving a plurality in favor of the synchronal combination of the two departments of study of 33 per cent over either of the other systems. Most of the advocates of this middle course are men of experience in both practical work and professional duties, and whose faith in the ability of the schools to make it a practical success is founded upon their knowledge of the requirements of both theory and practice. This result occurred in the face of the fact that the eloquent appeal of Holley was for a preliminary course, and that he was sustained by others of a wide experience. The following statement is a good example of this line of argument: "The introduction of a preliminary course of practical training before the scholastic training would be of great benefit to the schools themselves. It would weed out the hopelessly stupid or lazy, or otherwise unfitted, and bring to the schools a class of young men who already knew what they wanted, and really wanted it."

At that time, the participants in the discussion all took the ground that the practical training took a long time, and perhaps nearly as long as school training. This idea has since been proved to have little foundation by the experience at Cornell, at the Massachusetts Institute of Technology, at the Worcester Free Institute, at the Stevens Institute of Technology, at the Washington University, and others. It is found that a student will acquire all the skill of hand, power of observation, and familiarity with materials needed, in a short time. The practical course can therefore accompany the school work without taking away too much of the time required for culture and acquirement.

President Richards here quoted some of the arguments made against previous practice, by Colman Sellers and Prof. R. H. Thurston, and continued: Henry M. Howe has recently said: "For many reasons, this plan of sandwiching a year or two of field work between the college or the high school and the technical school, at working at metallurgical processes before understanding the elements of metallurgy, and when the processes themselves are incomprehensible, of observing the construction of bridges before acquiring the faintest idea of the principles of the girder, has not commended itself to the judgment either of our engineers or of our schoolmen."

Even in Germany, where preliminary training had long been a requirement, according to Dr. Wedding, "This prescription is now omitted, it being optional with the scholar to take it or come at once to the academy."

If the canvass were to be made at the present time, I am much mistaken if a large majority would not be in favor of the parallel method.

In regard to parallel courses of training, there are two ways of accomplishing it. They are thus stated by Prof. W. Chandler Roberts, of the Royal School of Mines, London: There is what may be called the system at Freiberg, as it is so well represented at the great school in Saxony, where the men study metallurgy theoretically, in lectures to which a somewhat limited laboratory course is added, the great feature of the instruction being the facilities that the men have for spending a portion of each day in the Halsburckner Hütte or the Muldner Hütte, these being the great works of the district in which the school is situated. And, finally, there is the system adopted in America, especially at the School of Mines, Columbia College, New York, and at the Massachusetts Institute of Technology at Boston, where, in addition to laboratory work as ordinarily understood, students carry out metallurgical operations, more or less experimentally, it is true, but, as an engineer would say, on a scale of nearly twelve inches to a foot.

Surely, it may be urged, the frequent opportunities for seeing metallurgical operations must be of great benefit to the student; but consider how short a time a student who is preparing for the higher branches of his profession can possibly give to the purely theoretical work that he must get through. Such a student has no leisure in addition to that which should be set aside for exercise; and if he had leisure, I do not think he would be putting it to the best advantage, if he were to devote it to looking on at a metallurgical operation conducted by some one else; and I believe that no system by which a student accompanies a demonstrator, or even a local foreman, to works, and only sees the successes and not the failures of other people's labors, really affords him adequate instruction. . . .

It will, I trust, have been understood that I have been speaking only of the training of a student; his career as a metallurgist can only be perfected in the works, because the manager has not only to deal with metals, but with men.

Edward C. Pechin has admirably stated some of the advantages of practical work, taken after the school course is over. He says: "Laboring men, as a class, are suspicious and unsympathetic, so far as their employer is concerned. By having associated with them, one becomes acquainted with their peculiarities, appreciates the difficulties they encounter, learns how to gain their good will, and this once gained, is enduring. And when the time comes for him to control, his power is well-nigh absolute; for he has learned when to watch, or relax, when to exact or indulge, when to be liberal or when unsparing. His knowledge obtained from books or in the school tells him what ought to be done; his practical experience shows him how it can be done, efficiently and economically."

It had not occurred to me to claim an American system; but since my attention was called to it, I have somewhat carefully canvassed the American schools, and it would seem as if the American system was practiced here even more than Professor Roberts claimed.

I must here state that Professor Roberts apprehended the strong points of the parallel school course when he specifies it as "nearly twelve inches to the foot."

C. Graham Smith has said: "It is a delusion to suppose that the requisite mechanical knowledge can be gained in the workshops attached to some colleges. It can no more be learned there than the execution of civil engineering undertakings can be mastered except by actual experience. The construction of toy engines with India-rubber pipes and soft solder, the turning of ivory dinner-napkin rings, or the making of a bicycle, may be pleasant amusements, but little or no actual knowledge is obtained in the use of tools, the properties of materials, or the business of the mechanical engineer."

All such remarks show complete misapprehension of the meaning we attach to the word workshop or mining laboratory. Within ten years, the growth of real workshops in connection with educational institutions throughout this land has been unprecedented. Some thirty-five mechanical laboratories or workshops have been established in nearly as many States of the Union, which shows that the American modification of the school workshop has come to stay.

In regard to mining laboratories, there are seven in active operation, under construction, or under contemplation, and to show that the mining laboratories of the country are real workshops, I give an illustration from the one with which I am most familiar. A student is assigned a quantity of ore, weighing from 500 to 4000 pounds, according to kind. He assays it, and makes mineralogical and chemical tests of it. He consults the books to see what processes are available for such an ore. He discusses the different processes before deciding. He chooses one, and works the ore through by it, testing by chemical analysis not only for the metals of commercial value to see what becomes of them, and to ascertain where the losses are hopeless, and where they can be diminished, but also to see what quality of products he has obtained, whether the slags are those of the standard of silicification he aimed at, whether the mattes, bullion, etc., are of the quality he planned for. He is assisted by his classmates in his work, and he in turn assists all of them in theirs. This work is interspersed with the studying of collateral literature, reading of papers before his class upon the subject to which he is devoting his time.

A year of such training, following after three years of preliminary technical school work, does not, to be sure, make an engineer of him; but it gives him a valuable lesson, most of it self-taught, in each of the following directions: 1. In accurate habits of thinking and working. 2. In acquisition of independent judgment. 3. In the habit of applying knowledge, which habit stimulates acquisition. 4. In gaining real experience by the sweat of emergency. 5. In managing men and controlling himself. 6. In appreciating the value of labor and the workmen's view of things. 7. In taking the conceit out of him. 8. In the use of chemistry to control metallurgy, and in the use of technical literature for suggestion and warning. 9. In keeping accurate accounts and records of his work. 10. In solving problems that are new to him. . . . Indeed, the question whether the mining engineer ought not to have a liberal amount of metallurgical training, and *vice versa*, is not by any means settled in the negative. To me, the question hangs just here: Are works in our country large, or are they small? If large, then we must have systematic divisions on strictly professional lines; if small, or if a few large works and many small ones, then we do not need such strict divisions, because the metallurgist will have to be an engineer, and the engineer will have to be a metallurgist. It is in accordance with this latter view that the courses of the Massachusetts Institute of Technology have been laid out; that is to say, the mining course may be taken, either emphasizing metallurgy with diminished engineering, or emphasizing engineering with diminished chemistry. A student who has worked in a mining laboratory will be better able to profit by the works, not only because of his better understanding of the subject, but because he has been a workman himself.

All agree that a school can not make an engineer. The idea has been well put by many authorities. I quote a few of them: "The young man who graduates from a technical school is no more a civil engineer than a young man who has never been at sea, but who has studied navigation at school, is a sailor;" again, "A graduate is excellent raw material to make an engineer of, but he is not a civil engineer;" and again, "The student may now be considered to have completed his preliminary training, but his education as an engineer will only be terminated by death."

If the schools can not make engineers, is it wise for them to give engineering degrees? The strongest of the several statements made several years ago was that of Mr. Ashbel Welch, which I quote as follows: "The school confers this title when these young men graduate, and what is the result? Why, they think they are engineers, and the consequence is, that in nine cases out of ten they will never learn to be engineers."

He even proposed "that the joint committee be requested take into consideration how to put a stop to the practice of the technical schools giving the young men who have just graduated the title of engineer."

This brings us to the point of considering the curriculum of the mining schools of the country. On examining the catalogues of the one hundred different American schools and colleges that seemed most likely to teach mining and metallurgy, I find forty-five that do not touch engineering subjects at all. Thirty civil and mechanical engineering schools. Eleven that claim to give the essentials of a mining engineering course, but have no independent professor of mining or metallurgy or of both subjects—Van Rensselaer Polytechnic, Sheffield Scientific School, Cornell University, University of North Carolina, University of Vermont and State Agricultural College, University of Virginia, University of Cincinnati, Virginia Agricultural and Mechanical College, Blacksburg, Vanderbilt University, University of Georgia, Corcoran Scientific School of Columbia University. Five colleges and universities that have a course of mining engineering, and also a professorship of mining or metallurgy, but have no independent scientific faculty: King's College, Nova Scotia, Lafayette College, University of Michigan, University of Wisconsin, University of Ohio.

The technical mining schools giving a mining course with a scientific faculty, and with a professor of mining or a professor of metallurgy, of a professor of both subjects: Colorado School of Mines, Columbia School of Mines, Lehigh University, Massachusetts Institute of Technology, McGill University, Missouri University, University of California, University of Illinois, University of Pennsylvania, Washington University.

The question that we now come to is, Ought not the school to do still better work? We can learn something in this direction by comparing the engineering profession with the learned professions—law, medicine, theology. Students who prepare themselves for these professions generally go through a high or Latin school, through a collegiate course, and then to the professional school; whereas the engineering student comes from

the high school directly to his technical school. The former course has the advantage of the student's greater maturity at the time he is studying the technical parts of his profession, and the disadvantage that the student has passed the age of the greatest acquisitiveness. The latter has the advantage that the student is working upon his profession at the age of greatest acquisitiveness, but the disadvantage of his lack of maturity.

I have prepared a table of twenty-five schools of law, medicine, and theology, showing the percentage of the students who are college graduates. From this table we find: Average of seven law schools, 42 per cent of students are college graduates; average of seven medical schools, 27 per cent of students are college graduates; average of eleven theological schools, 87 per cent of students are college graduates. Now I have not obtained a similar set of statistics from the leading engineering schools, but a glance at the catalogues shows that they have but a very few college graduates among their students. It is easy to see from these tables how much more mature in years the students of law, medicine, and theology must be than the students of engineering.

Now it is not by any means certain that a collegiate course offers the best preparation for the engineering school; and further, it seems certain that we shall not in the near future have any considerable number of college graduates within our technical schools.

The raising of the age and standard of admission to any great extent is plainly out of the question while the high school does the fitting for the technical school. The standard may be raised to seventeen and possibly eighteen years, and the languages French and German required for admission. Columbia School of Mines has already set us a good example in both these respects. I understand her minimum age for future classes will be eighteen years. This plan would relieve the earlier years of the technical school of work that does not belong to them. If now we can add to this a fifth year, we shall then have the course nearly all within the years of greatest acquisitiveness (from sixteen to twenty-two years, according to the authorities), the last year being at an age of sufficient maturity to bring the student to his advanced professional work in the very best condition of preparation, and, it seems to me, that this is the goal toward which the mining schools of the country should aim.

The president then announced the first paper, Notes on the Stamp-Mills and Chlorination Works of the Plymouth Consolidated Gold Mining Company, Amador County, Cal., by George W. Small, of Oconomowoc, Wis. Mr. Small was unable to be present at the meeting of the Institute, but his paper had been printed and copies were furnished to the members.

Some remarks on the paper were made by R. P. Rothwell, of New York, and E. Gybbon Spilsbury, manager of the Haile gold mine, South Carolina. This paper will be found on another page. The discussion will appear later.

Secretary R. W. Raymond then exhibited a Wolf safety-lamp, which will be noted in another issue.

VISIT TO THE IRON AND STEEL AND ZINC-WORKS.

About 100 members of the Institute, accompanied by a number of ladies, left the headquarters at the Sun Hotel, at nine o'clock Wednesday morning, and proceeded to the works of the Bethlehem Iron Company in carriages and by special train on the Lehigh Valley Railroad. The party, which was under the escort of Messrs. John Fritz, M. White, A. S. Schropp, George Chandler, Ellis Kent, J. E. Tatnall, Joseph Johnston, and Frank Johnston, made a tour of the steel mill, iron mill, blast-furnaces, engine-houses, machine-shops, foundries, etc., and examined the different departments of the works very carefully.

After an inspection of the iron-works, the party proceeded to the works of the Lehigh Zinc and Iron Company. Here they were met by J. Price Wetherill, Superintendent, William S. Cortright, Master Mechanic, and George C. Converse, chemist, who explained the working of the metal and oxide departments of the works. Metal was drawn from the retorts at the furnaces for the benefit of the visitors, and many other practical illustrations given. After examining the spiegel furnace and other appliances at the works, the party returned to the Union Depot on a special train, and then left for their hotels.

In the afternoon, the members of the Institute visited the Lehigh University and spent some time in examining the various buildings, special attention being paid to the laboratories. At three P.M., the Institute assembled in the University Chapel and was welcomed by Dr. R. A. Lamberton, President of the University. The reading and discussion of papers was then resumed.

ELECTROLYTIC TREATMENT OF ARGENTIFEROUS ZINC.*

At Friedrichshütte, in Silesia, the following modification of the treatment of the zinc, lead, and silver alloy obtained in desilverizing lead by Parkes's process has been introduced. The zinc-skimmings, averaging lead 90, zinc 8–10, and silver 0·5–2·0 per cent, are granulated and placed in a layer at the bottom of a lead-lined tub filled with a solution of sulphate of zinc, forming the electrolyte. The positive electrode is formed by the lead plate at the bottom, while the cathode is a zinc plate suspended vertically in the liquid. When a current of sufficient strength is passed through the apparatus, zinc is deposited on the cathode, a corresponding quantity of the metal being dissolved from the granulated alloy, so that the strength of the solution is kept approximately constant. The decomposition goes on until the residual alloy, which may be about one half of the regular quantity, is protected by the excess of lead from further action, when it is washed, dried, and subjected to liquation. By the latter operation, lead is separated of sufficient purity to be passed at once to the refinery, while the residue contains zinc and lead in about the same proportion as the original zinc-skimmings, and is of the same fine-grained character. This is subjected to the electrolytic process a second time, followed by subsequent liquation. By these alternate operations, zinc, lead, and silver are obtained in the metallic state, instead of the mixed oxides of lead and zinc, formerly produced in considerable quantity, which could only be made marketable with difficulty.

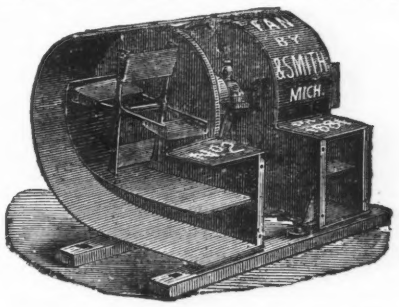
* Abstract of a paper in *Dingler's Polytechnisches Journal*, vol. cclix., 1886, p. 291. From the Minutes of the Proceedings of the Institution of Civil Engineers of London, edited by James Forrest, Secretary.

THE SMITH VENTILATING FAN.

From the days of Agricola to the present time, ventilating fans have been used in ventilating mines, and though Agricola's fan was a crude affair as compared with that of this day, the scientific principle of the fan, both for exhausting and for forcing air, was fully and most exhaustively investigated by Combes, Glepin, Fabry, Lemielle, Letoret, Guibal, and a number of other engineers, mostly in France and Belgium, but in recent years also in England and in this country.

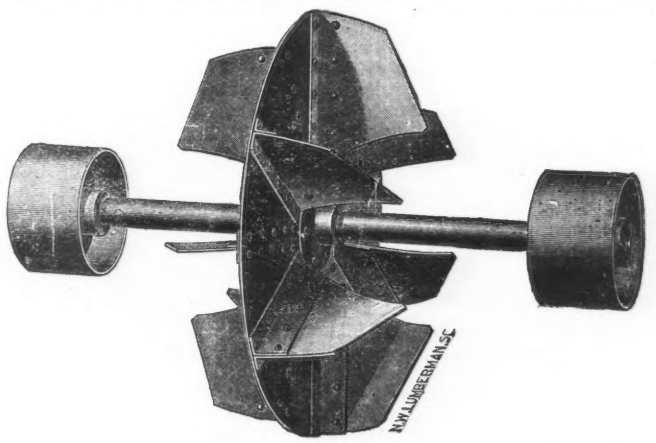
In England, where formerly the furnace was the only ventilator in use, the steam-jet was tried, and finally fans and air-pumps of various kinds were established, until at present the furnace is becoming rare, and no doubt in the near future it will become, as it should for coal mine ventilation, a thing of the past.

Notwithstanding all the investigations into the theory of centrifugal



fans and the elaborate experimenting that have been made, scarcely a year passes without some improvement being made in this, the most efficient and economical class of ventilators yet invented.

At one time, the form or number of the blades is changed. At another time, the form of the covering and the shape of the outlet or inlet is modi-



fied, and modifications in the construction are made with the object of cheapening this and rendering the fan less liable to get out of order.

Among the recent modifications that are claimed to produce good results may be mentioned the double discharge shown in the accompanying illustration of the Smith ventilator, as made by the Huyett & Smith Manufacturing Company, of Detroit, Mich., and some novel features of construction are shown in one of these illustrations, the blades being united to a central disk.

It is not necessary to give a detailed description of the various forms of fan made by these manufacturers; they are fully described in their catalogues and price-lists; but we may say that several features in the construction of these fans appear to be calculated to secure efficiency and durability, and, in fact, the low prices at which they are sold testify to their simplicity—one of the most important considerations to every one who has occasion to use fans.

Copper Wire for Telephones.—The Central District and Printing Telegraph Company, which controls the Bell Telephone patents in Western Pennsylvania, is making some important changes in its lines of wire. At present, it is replacing some 200 miles of wire throughout Pittsburg with a hard copper No. 14 wire that costs $25 a mile. The iron wire that is being removed cost $9 a mile.

Brick-Making at Haverstraw, New York.—The most extensive brick-making center in the United States is that of Haverstraw, on the Hudson River, thirty-two miles above New York, which has a capacity for making 340,000,000 bricks annually. In 1885, 300,000,000 bricks were turned out, against a like number in 1884. About 2000 men are employed, besides 300 in the river carrying trade, which keeps forty-four barges and fifty small vessels busy. Haverstraw bricks are of the ordinary description, but fetch from 25 to 50 cents per 1000 more than other bricks of like quality, owing to the excellent sand and clay used. They brought an average of $6 per 1000 in New York last season, after paying $1 river freight, and from $1 to $1.25 per 1000 royalty to the owners of the land where the yards are located. The works use in a season 42,000 cords of wood for heating kilns, at $5 a cord; 12,000 tons of coal-dust, at $2 a ton; and 4000 tons of coal, at $4.25 a ton; a total cost for fuel of $251,000. The total royalties were, as above, say $337,000, and wages (averaging $2.25 a day) say (six months) about $776,000. Two hundred patent brick-pressing machines, costing $1000 each, are employed. The total gross receipts last year are given at $1,800,000. This particular industry began fifty years ago. At that time, $3 per 1000 was a fair price. Quotations have been as high as $9.

THE WEAR OF IRON AND STEEL RAILS.

Sir I. Lowthian Bell recently gave the following evidence before the Royal Commission on the Depression of Trade: There are few questions of greater interest to railroad companies and to iron manufacturers, and none upon which greater diversity of opinion prevails, than the comparative durability of iron and steel when exposed to the wear of heavy railroad traffic. When it seemed probable that the old welded rails might have to give way to those rolled from a solid ingot, numerous calculations were put forth as to the comparative durability of the two materials. Owing to the peculiarities in the manufacture, the ordinary iron rails are apt to laminate or split off at the weldings of the separate bars that constitute the mass out of which they are rolled. At other times, owing to the softness of the material itself, the rail-head is crushed down by the great weight of the traffic passing over it. These defects were not removed when, by means of mechanical puddling, the rails were rolled out of one solid mass, because the process itself, separating the malleable metal in the form of granules, gives a product made up of an infinite number of welded particles, from which it is almost, if not quite, impossible to expel all traces of scoria generated during the process of manufacture. The ingot of Bessemer steel, on the other hand, having been previously completely liquefied in the converter, an opportunity is afforded for an almost entire separation of scorious matter, by virtue of the great difference in the specific gravity between it and the molten metal. Rails made from a mass so nearly homogeneous are not liable to be broken up in the same manner as happens with iron; for steel being much harder, and possessed of a much greater tensile strength than puddled iron, it was only reasonable to suppose that the loss of weight from abrasion would be less than that which attends the use of iron. Notwithstanding the great superiority of steel in reference to the two qualities just named, the experience of the Northeastern Railroad would indicate that the actual wearing away of the substance of the rail is greater than in the case of iron.

The system known under the name of the Northeastern Railroad consists of 1401 miles of road, exclusive of sidings, of which 954 miles are double and 447 miles are single roads. The rails used are of the double-headed pattern, weighing usually 82 pounds per yard, set in chairs placed on wooden sleepers. For some time past, nothing but steel has been used for renewals, so that, by the end of 1884, 903 miles, chiefly the double way, were of this material, and 498 miles of iron. The traffic, taking the Northeastern line as a whole, is probably a fair average representative, in point of extent, of the railroads of the United Kingdom; but by far the largest amount is carried on the roads in the county of Durham and in the North and West Ridings of Yorkshire.

Notwithstanding the short life of some of the iron rails, for the reasons already given, the average duration of the 903 miles of those that have been replaced with steel is 13·4 years, and the average life of those still in use is 12·1 years. From some cause or another, the large increase of traffic being probably the chief one, the inspectors on the line consider ten years as the present life of an iron rail on those parts of the system where the traffic is most severe, both in respect to weight and speed. On the other hand, where the traffic is less heavy, even when the speed of the trains is frequently high, as on the York & Scarborough branch, iron rails are now in use that were laid down twenty-two years ago.

The length of the time during which steel has been laid down on the Northeastern system is not sufficiently long to enable its managers to speak, from actual removals over the whole length, as to its durability. Some, but only an exceedingly small proportion as compared with iron, fail at an early period, not from lamination or crushing, but from fracture. Such as have been removed from this and other causes have averaged ten years of wear. In the case of rails of malleable iron, renewals are necessary long before their loss of weight from abrasion renders them unsafe, by reason of their diminished weight and consequent want of the proper strength. This happens, as a rule, when the actual loss from this cause does not exceed 4 or 5 per cent of the original weight; while in steel rails, abrasion proceeds until either the carriage-wheels touch the chairs, or the loss of weight is considered such as to render the rail too light for the work it has to perform. The following are cases of single rails that have been taken up and the loss of weight ascertained:

When laid.	Steel rails taken up at	Original weight per yard.	Years in use.	Loss per yard.	Percentage.	Analyses. Per cent.			
		Lbs		Lbs.	Per annum	C.	Mn.	Si.	P.
1866.	Milford Junction	78½	12	8·50	0·90	·27	·33	·05	·06
1866.	South-End Bramhope Tunnel	80½	12	20·125	2·083	·26	·26	·35	·11
1869.	Darlington	82	9	15·250	2·065	·24	·30	·05	·10
1870.	Scarborough	82	8	10·50	1·60	·31	·34	·19	·09
1875.	Between Croft and Darlington	80	3	1·00	0·42	·42	·81	·13	·07
1876.	Darlington	80	2	1·25	0·78	·38	·67	·08	·09
1877.	Staddlethorpe	80	1	1·12	1·40	·40	·72	·08	·09

The average percentage of this extraordinary loss of weight is 1·321 per cent per annum, and if 20 per cent were considered the extreme at which it would be safe to go, fifteen years would about represent the length of the life of a steel rail. A piece of road between Gateshead and Pelaw Main Station, 4554 yards in length, was laid upon the heavy-load side with iron rails in April, 1859. In May, 1869, they were replaced with the same section of rails made of steel, which in their turn had to be removed in June, 1879. Practically, therefore, each kind lasted exactly ten years, but in the mean time a marked change had taken place in the traffic. In the year 1868, the Team Valley line was opened, upon which all the London express and some other trains, as well as the through goods trains which formerly went via Gateshead and Pelaw Main, were dispatched. On the other hand, the annual quantity of coal worked from the Northumberland and Durham coal-field averaged 22,000,000 tons for the decade ending 1869, and about 32,000,000 for that ending in 1879. If this change can be taken as an index of the traffic on the Northeastern line in general, and on the section in question, the life of the iron rails, estimated by the weight of traffic, would have been worn out in seven years, while those of steel lasted ten years. This more extensive trial would give to the steel rails a life longer by one half than those of iron. It ought, perhaps, to be mentioned that the stretch of line between Felling and Pelaw Main is in the midst of chemical-works, where metal-work is speedily corroded, and I am unable to say whether the steel or the iron rails in use suffer most when exposed to such an atmosphere as prevails there. To get the annual quantity of pig-iron required for the renewals, I have calculated that it takes 23½ hundredweight of pig to make a ton of steel, and 27¼ hundredweight a ton of iron, rails, and 21 hundredweight to make a ton of chairs. The following estimates are made on these figures, and on the supposition that an iron rail lasts 10 and a steel one 15 years, and that the loss of weight is 4 per cent and 15 per cent during the respective periods. The length taken is 100 miles of single way, for which it is assumed 12,000 tons of rails and 7000 tons of chairs are required: For iron rails: One tenth of 12,000 tons, 1200 tons; less weight from abrasion, 4 per cent, 48 tons; remaining for use in re-manufacture, 1152 tons.

If we regard these old rails as puddled iron, which they usually take the place of, it may be considered that the 1152 tons will produce 1025 tons, or 175 tons less than the 1200 tons they have to replace. Now this loss of weight represents at 27¼ hundredweight per ton of rails 240·62 tons of pig; to which add one tenth the weight of chairs laid down, namely, 7000, equal to 700, losing 1 hundredweight per ton in wear and re-melting, 35 tons of pig; making together of pig-iron per annum 275·62 tons of pig.

Steel rails: One fifteenth of 12,000 in use, 800 tons; less waste from abrasion taken at 15 per cent, 120 tons; the loss on converting this 680 tons into rails is about 101·28 tons; giving thus of new rails 578·72 tons.

The difference between the last-mentioned number and the quantity it has to replace (800 tons) is 221·28 tons.

To produce 221·28 tons of rails at 23½ hundredweights per ton = 259·99 tons of pig; to which add one fifteenth of 7000 tons of chairs, losing 1 hundredweight per ton on 466·66 tons in wear and re-melting, 23·33; making together of pig-iron per annum 283·32 tons.

Thus it appears that, although steel rails are made with a smaller consumption of pig-iron, and last longer than those of iron, the annual weight of crude metal required for repairs of the permanent way is a trifle larger, on the basis assumed, with the more durable material, owing to the loss while in use. These calculations as to the loss of weight incurred in the renewals of the permanent way are obviously entirely dependent for accuracy on the actual life of the two kinds of rail. Of iron, experience enables us to speak with certainty; but such is not the case with steel, and should this material be able to resist the wear under the heaviest traffic of the Northeastern Railroad for twenty instead of fifteen years, the loss, as given in pig-iron, would be correspondingly affected. I am disposed, moreover, to think that, unless in very exceptional circumstances, abrasion of steel rails to the extent of 1 per cent per annum is overstated, because in the case of forty-eight rails recently examined the yearly loss of weight from this cause averages only ·60 per cent. At the same time, it has to be observed that of these there are six cases (nearly 13 per cent of the whole) in which the wear exceeded 1 per cent, the particulars of which are given in the foot-note,* and in respect to which it is considered that there was nothing either in the traffic passing over them or in the quality of the rails to account for the excessive amount of abrasion. In twenty years, a rail originally 82 pounds per yard would, with an annual loss of ·60 per cent, weigh 72·16 pounds. In testing the iron rails intended to be placed on the Northeastern line, each specimen selected for trial is placed on supports three feet apart, and a weight of 672 pounds dropped upon it twice from a hight of at least 5 feet. The fall is required to be increased to 16 feet before the rails give way. For proving the steel rails, which are placed also on supports 3 feet apart, the weight used is one of 1800 pounds, allowed to fall twice from a hight of 5 feet, and a third time from a hight of 27 feet, which they bear without fracture.

Some very interesting experiments have been tried recently by the inspectors of the permanent way of the Northeastern Railroad on the 48 rails just referred to, which confirms the opinion that the continued vibrations of the passing trains have so altered the molecular structure of the steel as to have greatly impaired the strength of the metal. In the experiments, the rails were placed on supports 3 feet apart, and a weight of 1800 pounds was dropped from different heights, usually commencing with 1 foot, and increasing the fall until fracture took place. The following figures show the particulars of the trials.

Forty-eight steel rails tried as follows:

Number of rails tried	6	11	12	2	3	1	1	2	1	2	3	4
Fall in feet at which fracture took place	1	2	3	4	5	6	7	8	9	11	15	15

The last four specimens under the fall of 15 feet did not break.

The average age of the rails when taken out was 12·04 years; the average loss per annum was ·606 per cent.

The deterioration of strength appeared so serious that two lots of rails, one of iron and one of steel, were submitted to trial under the weight of 672 pounds, of which, when the iron rails were new, two blows

* Particulars of six rails in which the wear exceeded 1 per cent per annum:

Annual abrasion.	Years in use.	Situation on main line.	Contained per cent.				
			Carbon	Silicon.	Sulphur.	Phosphorus.	Manganese.
1·01	15	Fence House	·39	·10	·10	·05	·35
1·05	17	Pelaw Main	·28	·02	·07	·09	·23
1·07	9	Sherburn	·45	·07	·12	·05	·67
1·15	12	Leamside	·47	·08	·20	·06	·92
1·29	14	Heaton Station	·41	·06	·13	·09	·45
1·51	10	Pensher	·36	·15	·08	·07	·07

of 5 feet and one of 16 feet without fracture were considered satisfactory.

Eighteen iron rails broke as follows:

Number	8	6	1	2	1
Fall in feet	2	3	4	5	10

Average age, 11·5 years; average total waste, 4·16 per cent = ·36 per cent per annum.

Twenty-one steel rails broke:

Number of rails	3	7	6	2	1	1	1
Fall in feet	3	4	5	7	8	9	17

Average age, 12·66 years; average total waste, 8·42 per cent = ·66 per cent per annum.

These two last experiments demonstrate that the iron rails have not lost so much of their original strength as those of steel; but, on the other hand, at the end of the 12·66 years, the steel rails were still abundantly strong for their work.

We may infer from these facts that no risk is encountered from the change that has taken place in the steel rails now in use, but it is a subject that commends itself to the attention of all railroad engineers.

CHLORINATION OF GOLD ORES.*

Plymouth Consolidated Gold Mining Company, Amador County, Cal.

The ore, as it raised from the mine, has an average assay value of $11 a ton, chiefly in the form of free gold. All the ore goes directly to the stamp-mills, of which there are two. The older and larger mill contains sixteen batteries of five stamps each, with one Frue vanner to each battery. The new mill has eight batteries of five stamps and two Frues to each battery. The large mill is driven by Leffel turbine-wheels, with a pressure of eighty feet, and a consumption of 600 miners' inches of water. The smaller mill is driven by "hurdy-gurdy" wheels with a pressure of about 550 feet and a consumption of 150 inches of water.

At both mills, the tailings from the stamps pass over about 20 feet of plates on their way to the Frues. In each set of plates, the first or upper one is copper, the rest are so-called silver plates.

The bullion from the stamps is about 800 fine in gold and 200 in silver.

The concentrates from the Frues average from 1¼ to 1½ per cent of the ore stamped. They very rarely exceed 2 per cent. I was unable to get the exact assay value of the concentrates, but it is said to vary between $100 and $200 a ton.

The concentrates are treated at the chlorination-works at the rate of one hundred tons a month. The capacity of the works is somewhat greater than this; but as the supply of concentrates is limited, it is not deemed advisable to work them up any faster.

Care is taken to keep the concentrates always damp until they are put into the roasting-furnace. If this is not done, a decomposition of the pyrites begins, forming lumps that do not roast, and which consequently cause a loss of gold in the residues from leaching.

A *Fortschaufelungsofen* is used for roasting. Its dimensions, including fire-box, are 12 feet by 80 feet. The hearth is one continuous plane, but the charges, of which there are three in the furnace at one time, are kept entirely separate. The furnace-men call the three compartments the "drying," the "burning," and the "cooking" compartments. In the middle or "burning" compartment, the ore is spread out very thin, and occupies about double the space of either of the other compartments.

The furnace is worked by eight-hour shifts, one man on each shift, and one charge is drawn and a new one added in each shift. The charges weigh 2400 pounds, and carry about 10 per cent of moisture. The ore averages about 20 per cent in sulphur, and just before the sulphur ceases flaming (in the second division of the furnace), 18 pounds, or ¾ per cent, of salt are added to the charge.

The roasted ore from each shift is kept by itself on the cooling-floor until a tankful (about 4 tons) has accumulated from a single man's shift; then that lot is worked by itself. This enables the person in charge the better to control the roasting; for if only one lot out of the three is bad, it is presumable that the fault lies with the workman; but if all three are bad, the probabilities are, that there has been a material change in the character of the ore, and the roasting process must be altered accordingly.

The vats for chloridizing the roasted ore are 9 feet in diameter by 3 feet in hight, and are four in number. They are slightly inclined, so that they will drain completely. The bottom of each tank is occupied by a filter about 6 inches thick, composed as follows: Light strips of three-quarter inch wood are first laid in the bottom of the tank at intervals of about one foot. Across these strips, are laid six-inch boards, leaving cracks of an inch or more between the boards. On top of this loose floor, are placed coarse lumps of quartz, and on top of this again finer quartz material, until a total depth of about five or six inches is obtained. Finally, this "sand-filter" is covered by another loose floor; the boards lying crosswise to the loose floor beneath, and pretty close together. This upper floor is intended merely to furnish a shoveling surface, so as to permit the removal of the leached ore from the tanks without disturbing the filter.

The ore to be chloridized must be damp (about six per cent moisture). The working test is, to take a handful of the ore and squeeze it, then open the hand, and if the lump immediately begins to crumble and fall apart (not run), the ore has the requisite amount of moisture.

The damp ore is screened into the tanks, so that it will lie as loosely as possible, and facilitate the penetration of the chlorine gas. A coarse screen of one half inch mesh is used for this purpose.

The tanks are only filled up to within about three inches of the top. This is to insure that the entire contents of the tank are covered by water in the subsequent leaching, otherwise there will be great difficulty in washing out all the soluble gold.

As soon as the tanks are filled as stated, they are ready for the introduction of the chlorine gas. This is introduced into the bottom of the tank from two opposite sides, and is continued until ammonia held over the ore gives off dense fumes of ammonium chloride. This usually takes about four hours. When this point is reached, covers are placed on the tanks and the cracks are luted with a mixture of leached ore, bran, and water. The gas-generators, of which there are two employed at one time in charging a tank, are allowed to work on until they are exhausted; then they are disconnected and the holes in the tank are plugged.

The tank is usually charged with gas in the morning, and is left standing for two days. On the third day, the ore is leached. The tank is first filled with water and allowed to stand a few minutes so that the water may penetrate all the ore. If no more water is absorbed, the liquor is drawn off at the bottom, care being taken to keep the tank full of water during the entire operation, which takes from four to five hours.

In charging the tank, a gunny-sack is laid on top of the ore, where the wash-water is afterward to be introduced, in order to better distribute the water in the tank and prevent its washing and packing the ore.

The liquor from the leaching-vats is conducted to settling or storage-tanks, and about 40 pounds of sulphuric acid (66 degrees B.) is added. (Experience has shown this addition of acid to be advantageous in obtaining a clean product in the subsequent precipitation. The chemical reaction, is, however, by no means clear.) It is usually allowed to stand for twenty-four hours, but two hours are quite sufficient. It is then run into precipitating-tanks, and the gold is precipitated by a solution of sulphate of iron. The iron solution is added until, after stirring, a further addition produces no purple color. After the gold is precipitated, it is allowed to stand two or, if convenient, three days to settle; then the supernatant liquor is drawn off with siphons into a second settling-tank, where any gold that may have been drawn off by the siphons has a second opportunity to settle. The liquor stands in this tank until it is necessary to run it off to make room for another charge. Very little gold is found in this tank, and it is therefore only cleaned out once during the year. In the mean time, fresh liquor has been run into the precipitating-tanks upon the gold already precipitated there. In this way, the gold is allowed to accumulate until the semi-monthly clean-up. Except when it is necessary to have them open, the precipitating-tanks are kept covered and locked.

In making the clean-up, the supernatant liquor is siphoned off, the gold gathered up and placed in a filter of punched iron lined with a sheet of ordinary filter-paper and washed with water until all the acid and iron salts are removed. It is then dried, melted in crucibles, and cast into bars.

The works extract from 95 to 96 per cent of the assay value of the concentrated sulphides. Two men, on day-shift, attend to all the work of handling the ore after it is washed (the leaching, etc.). The head man receives $3, the other $2.50 a day. Owing to the limited amount of ore allotted to the works, only three tankfuls are leached every four days. The men, however, are employed steadily.

The sulphate of iron is manufactured on the spot. For this purpose, an ordinary wooden tank about 4 feet by 4½ feet, standing outside the building in the open air, is used. The tank is kept full of water and supplied with old scrap-iron *ad libitum*, and for each charge to be precipitated about 40 pounds of acid are added to the tank.

The precipitating-tanks, which are of wood, are protected from the action of the acids by a coating of "paraffine paint."

I append an itemized statement of the cost of handling the ore. The basis of figuring is 100 tons of ore per month of 30 days. Consumption of chemicals in the leaching department, 24 days in each month:

Roasting:		
Three men, at $2.50 per day, for 30 days	$225.00	
1¾ cords wood, at $4.25 per day, for 30 days	223.13	
54 pounds salt, at ¾ cent per day, for 30 days	12.15—	$460.28
Generator: The charge is manganese, 30 pounds; salt, 34 pounds; sulphuric acid, 60 pounds; therefore, for two generators:		
Manganese, 60 pounds per day, 24 days, at $47 per ton	33.84	
Salt, 68 pounds per day, 24 days, at $15 per ton	12.24	
Acid, 120 pounds per day, 24 days, at $60 per ton	86.40—	132.48
Acid for settling-tanks (40 pounds), and for sulphate of iron manufacture (40 pounds), 24 days		57.60
Wages of leachers, at $5.50, for 30 days		165.00
Salary of foreman		125.00
Total		$940.36

Or, per ton of concentrates, $9.40 3-10.

* A paper read before the American Institute of Mining Engineers, Bethlehem, Pa., May, 1886, by George W. Small, E.M., Oconomowoc, Wis.

The Preservation of Wood.—*Le Génie Civil* says: M. Lostat, a French contractor, preserves wood of all kinds by piling the wood in a trench or trough, covering it with quicklime, and sprinkling with water. The lime-water not only preserves the wood from decay, but makes it harder and stronger. M. Mancion proposes to preserve wood by injecting the following antiseptic liquors: 1st. A solution of 156 grams of arsenic acid and 3600 grams of phenic acid in 100 liters of water. 2d. A solution of 10,600 grams of ferrous sulphate in 100 liters of water; after having prepared the wood for the injection by the action of a steam-jet.

Metal-Work of the Burmese.—Both Burmans and Shans are expert blacksmiths, says the Journal of the Society of Arts. The latter forge all the *dahs* ("native hatchets") used by themselves and their neighbors in the Hotha Valley; and they annually resort to Bhamo, and the villages in the Kakhyen hills, for the purpose of manufacturing them. Their bellows are of the most primitive stamp, consisting of two segments of bamboo, about four inches in diameter and five feet long, set vertically, forming the cylinders, which are open above and closed below, except by two small bamboo tubes, which converge and meet at the fire. Each piston consists of a bunch of feathers, or other soft substance, which expands and fits tightly in the cylinder while it is forcibly driven down, and collapses to let the air pass as it is drawn up. A boy, perched on a high seat or stand, works the two pistons alternately, by the sticks serving as piston-rods. Charcoal is used for fuel. The casting of large and small articles in brass, bronze, and other alloys, is much practiced, always adopting the method known as *à cire perdue*. First, a clay model is made, and coated with bees-wax to the thickness of the intended cast, and again covered with an outer skin (two inches thick) of clay mixed with finely chopped straw; this latter coat is provided with funnel-like holes, for pouring in the molten metal, at intervals of four inches, and with straw-holes for letting out imprisoned air. Holes are also provided at the bottom for the escape of the melted wax,

SMELTING ANTIMONY IN THE BLAST-FURNACE.*

By C. M. A. Balling.

At Pribram, antimony ores, both sulphides and oxides, with a considerable quantity of siliceous waste, are smelted in a blast-furnace for crude metal (star regulus), which is subsequently refined in a reverberatory furnace.

The composition of the materials forming the blast-furnace charge is as follows:

MATERIALS.	Dressed ores.		Oxidized ores.	Liquation residue.		Flue stuff.	Refining slag.
	Raw.	Calcined.		Raw.	Calcined.		
Antimony	43·3	48·9	46·4	21·4	23·1	56·1	25·7
Iron	14 4	....	....	12·9	....	....	....
Sulphur	25·3	0·7	3 6	15·1	2·4	....	....
Ferric oxide	....	23 4	2·4	....	17 3	6·9	....
Silica	11·7	23·3	26·6	41 6	49·2	10·8	5·9
Alumina	0·3	4 0	....	0·5	2 4	....	...
Carbonate of lime	3·3	....	7·0	4 0	....	....	....
Lime	....	1·0	..	4·0	0·7	....	....
Sulphide of antimony	....	....	...	....	....	...	2·4
iron	....	....	....	....	....	....	53 4
sodium	....	....	....	...	....	...	9·0
Carbon	....	....	....	....	....	5 1	...

The blast-furnace has a round stack 6 meters high, 1·4 meters in diameter at the throat, and 1 meter in the hearth, which is closed, and has five water tuyeres and three outlets for the molten products—an upper one for the slag, and two at the hearth bottom. Of these latter, one communicates with the exterior by a passage having a slight rise, and forms the ordinary tap-hole for the metal, while the other has a horizontal outlet, and is only used in blowing out the furnace. The blast, supplied by a Krigar screw-blower, amounts to 15 cubic meters per minute at 30 cubic meters water-pressure. The gases are collected by a tube leading from the side of the furnace a short distance below the throat. The furnace is kept in blast for three weeks continuously, and smelts 19·2 tons of materials daily.

The smelting mixtures are of two kinds, whose composition is as follows:

	A. Kilograms.	B. Kilograms.
Calcined dressed ores	550	600
liquation-residues	750	600
Ores balled with lime	200	...
Flue stuff " "	100	....
Raw ore	...	100
Oxidized ore	....	100
Raw liquation-residues	...	100
Limestone	600	800
Foul furnace slags	400	400
Refining slags	....	200
Crude antimony metal No. III	....	100

The most favorable result is obtained when these mixtures are used alternately, two charges of A being followed by one of B.

Lime is used to the extent of 10 per cent. to ball up part of the washed ore to a compact mass, and some of the flue stuff is similarly treated, but with only 7 per cent. This is, however, only necessary at starting, as it is found that, when the furnace has been blowing for eight or ten days, the materials may be charged in powder without in any way injuring the working of the furnace.

The products of the blast-furnace are crude antimony metal, slag, and flue stuff. The first is divided into three classes, of the following average composition:

	No. I.	No. II.	No. III.
Antimony	90 02	73·80	65 04
Iron	6·23	16 66	23·80
Sulphur	2·85	8·42	10·46

The first two qualities are sent to the refinery-furnace, while No. III. goes back to the blast-furnace. The relative proportions are: No. I., 82·5; No. II., 9·0; and No. III., 8·5 per cent of the total output of the furnace.

The slags produced in the blast-furnace vary slightly in comparison with the smelting mixtures. Thus—

Silica	46·9	45·9
Lime	34·6	31·4
Ferrous oxide	15·1	19·9
Antimony	0·5	0·9

The first is produced from the mixture A, and the second from B.

There is very little flue-dust produced in the blast-furnace, the bulk of the product being derived from the preliminary operation of calcining the dressed ores. This is done in a single-bedded reverberatory furnace 8 meters long and 2 meters broad, with five working-doors on one side, heated with brown coal, which is burned upon a step-grate. The produce is about 24 cwt. a day. The ore, which is charged in quantities of 4 cwt. at a time, clots and softens, giving off a large quantity of sulphurous acid as soon as it attains a low red heat, but subsequently becomes dry again, and when finished is in the state of powder. The average time the charge remains in the furnace is twenty hours. The liquated residues are roasted in stalls upon a bed of old mine timber, the heap being allowed to burn for five or six weeks.

The refining of the crude blast-furnace metal is conducted in a reverberatory furnace with an iron bed 4 meters long by 2·5 meters broad, covered with a layer of fire-clay 28 inches thick. Brown coal is used upon an ordinary grate in the fire-place. The working-door is one side, and the tapping hole at the end of the bed. The gases on their way to the chimney pass under an iron plate below the furnace, upon which the molds for the refined metal are placed in order to warm them. The charge consists of 9 cwt, of No. I. metal, 1 cwt. of No. II., the first being coarsely broken, while the second is in powder, to which are added 42 kilograms of sulphate of soda, 5 kilograms of charcoal-dust, and 150 kilograms of unroasted ore. The operation lasts ten hours, and a final slag is made by the addition of 3·39 kilograms carbonate of potash, 2·61 kilograms carbonate of soda, 1 kilogram of raw and 6 kilograms of calcined crude antimony regulus (liquated sulphide of antimony), and 12 kilograms of the same slag from previous operations. The refined metal (star regulus) contains as impurities:

	Per cent.
Arsenic	0·330
Iron	0·052
Silver	0·006
Sulphur	0·720

* Abstract of a paper in *Stahl und Eisen*, vi., p. 62. From the Minutes of the Proceedings of the Institution of Civil Engineers of London, edited by James Forrest, Secretary.

A SECTIONAL SLAG AND MATTE POT.*

By Richard H. Terhune, Salt Lake City.

Slag and matte, in lead and copper smelting, are, for convenience of removal, tapped into pots of small capacity, usually of paraboloid form, of cast-iron, weighing from 275 to 300 pounds, and holding the same weight of slag.

As in many smelting districts one ton of ore makes a ton and a quarter of slag, a large number of pots is needed to equip an ordinary plant.

Sudden and frequent expansion of the solid bowl causes the pots to crack at the bottom in a few months, and the matte, a very fluid sulphide, enters these rough fissures and speedily corrodes its way through the vessel. I find, from one year of practice with a slag-pot having a movable bottom, that this cracking tendency is entirely overcome by such a device.

Mr. Terhune's pot is cast with a six-inch hole cored in the bottom. This results in a stronger casting than a solid one of the same form. Into this hole is inserted a flanged bottom.

Four rivets, countersunk inside, make a tight and permanent joint. The castings are made rough.

* A paper read at the Bethlehem Meeting of the American Institute of Mining Engineers, May, 1886.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price!]

A Course on the Stresses in Bridge and Roof Trusses, Arched Ribs, and Suspension Bridges. Prepared for the Department of Civil Engineering at the Rensselaer Polytechnic Institute. By William H. Burr, C.E., Assistant to the Chief Engineer of the Phœnix Bridge Company, Member of the American Society of Civil Engineers, etc. Third Edition. New York: John Wiley & Sons. 1886. 8vo. Pages xii+454, numerous Figures, and 13 Folding Plates. (*No Index.*) $3.50.

Chap. I. General consideration of the laws governing the action of stresses in trusses. II. Special non-continuous trusses with parallel chords. III. Non-continuous trusses with chords not parallel. IV. Swing bridges. Ends simply supported. V. Swing bridges. Ends latched to supports. VI. Swing bridges. Ends lifted. VII. Continuous trusses other than swing bridges. VIII. Arched ribs. IX. Suspension bridges. X. Details of construction. XI. Wind stresses and braced piers. Appendix I. The theorem of three moments. II. The resistance of solid metallic rollers. III. The Schwedler truss. IV. Reactions and moments for continuous beams.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

GRANTED MAY 4TH, 1886.

341,280. Method of Sealing Natural Gas Pipe Joints. Jacob Schinneller, Pittsburg, Pa.
341,285. Method of Working Regenerative Gas-Furnaces. Frederick Siemens, Dresden, Saxony, Germany.
341,308. Vapor-Fuel Apparatus. Augustin I. Ambler, Washington, D. C.
341,327. Automatic Expansible Tube for Wells. Owen Fay, Warren, Pa.
341,354. Process of Manufacturing Gas. Roland H. Smith, Pittsburg, Pa.

GRANTED MAY 11TH, 1886.

341,506. Apparatus for Manufacturing Gas. Henry C. Rew, Chicago, Ill.
341,522. Safety-Stop for Mining-Cages, etc. James W. Terman, Des Moines, Iowa, Assignor of three fourths to H. S. Butler, same place.
341,529. Rolls for Reworking Old Rails. John D. Williams and George P. Raidabaugh, Danville, Pa., Assignors of one half to Grove, Grier & Co., Limited, same place.
341,530. Rolls for Reworking Old Rails. John D. Williams and George P. Raidabaugh, Danville, Pa., Assignors of one half to Grove, Grier & Co., Limited, same place.
341,544. Gas-Pressure Regulator. Charles H. Baker, Meadville, Pa.
341,569. Rolling I-Beams into Plates. William H. Graham, Pittsburg, Assignor of two thirds to Hay Walker, Jr., Trustee, Alleghany, and A. C. Milliken, Millvale Borough, Pa.
341,570. Rolls for Rolling Beams into Plates. William H. Graham, Pittsburg, Assignor of two thirds to Hay Walker, Jr., Trustee, Alleghany, and A. C. Milliken, Millvale Borough, Pa.
341,578. Apparatus for Concentrating Ammoniacal Liquor. Charles W. Isbel, New York City.
341,607. Gas-Pressure Regulator. Albert Sauer and Gustav F. Sievern, Pittsburg, Pa., Assignors of one half to Carl Kahler, New York City.
341,611. Dredging-Machine. John Thompson, Bucyrus, Ohio, Assignor to the Bucyrus Foundry and Manufacturing Company, same place.
341,612. Dredging-Machine. John Thompson, Bucyrus, Ohio, Assignor to the Bucyrus Foundry and Manufacturing Company, same place.
341,613. Dredging-Machine. John Thompson, Bucyrus, Ohio, Assignor to the Bucyrus Foundry and Manufacturing Company, same place.
341,614. Dredging-Machine. John Thompson, Bucyrus, Ohio, Assignor to the Bucyrus Foundry and Manufacturing Company, same place.
341,622. Process of Manufacturing Illuminating Gas. John B. Archer, Washington, D. C.
341,624. Apparatus for Manufacturing Illuminating Gas. John B. Archer, Washington, D. C.
341,627. Apparatus for Generating Gas or Vapor. John B. Archer, Washington, D. C.
341,629. Apparatus for Generating Vapor or Gas. John B. Archer, Washington, D. C.
341,637. Pumping and Drilling-Machine. Abraham W. Carnahan, Rouseville, Pa.
341,673. Hydraulic Air-Compressor. John N. McLean, Philadelphia, Pa.
341,750. Gold-Washing Apparatus. Simon S. Heller and Calvin L. Heller, Boulder, Colo.
341,776. Gas-Pressure Regulating Valve. Levi Shook, Pittsburg, Pa.
341,784. Flux for Welding. Edward A. Whitcomb and John J. Riddle, Cincinnati, Ohio, Assignor of part interest to Mary E. King, same place.
341,785. Welding-Flux. Edward A. Whitcomb and John J. Riddle, Cincinnati, Ohio, Assignors of nine sixteenths to Mary E. King, same place.
341,813. Drill Machine. John C. Muirhead, Grub Gulch, Cal.
341,822. Barometer for Indicating Fire-Damp. Rudolph Ritter von Walcher-Uysdal, Teschen, Austria-Hungary.
341,863. Amalgamator. John W. Van Brocklin, Seattle, Wash., Assignor of one half to William R. Forrest, same place.

FURNACE, MILL, AND FACTORY.

The Sharon Iron Company's Works, at Sharon, Pa., started up on the 18th inst., after an idleness of nearly one year, and are running full blast. Indications point to a steady run. Every furnace in Sharon is now in blast.

The two open-hearth furnaces of the Volta Iron Company, Limited, which have recently been built at Apollo, Pa., will be in operation soon. The galvanizing works have been removed from Pittsburg to Apollo.

Z. P. Dederick has purchased the Sherman Iron Works, at Sherman, Texas, for $10,000. Extensive alterations will be made and new machinery added.

The Chicago Wire-Works, Chicago, Ill., have reduced the capital stock from $100,000 to $50,000.

The Colebrookdale Iron-Works, Colebrookdale, Pa., belonging to the estates of Frederick and Peter Y. Brendlinger, have been sold to John Sabold.

The Milton Manufacturing Company has been organized at Milton, Pa., with a capital of $30,000, to manufacture iron and steel.

The Dry Placer Mining Machine Company has been incorporated at Chicago, with a capital stock of $600,000; incorporators, John W. Parmelee, Robert Lyman, and Charles E. Rollo.

It is reported that the Joliet Steel Company intends to increase its capital stock from $2,000,000 to $3,000,000.

The commission for building the new bridge across the Harlem River, New York City, received, on April 22d, the following proposals: For the metal work: King Iron Bridge and Manufacturing Company, $1,180,000; Phœnix Bridge Company, $1,116,000; Union Bridge Company, $687,500; Passaic Rolling-Mill Company, $880,152; New Jersey Steel and Iron Company, $899,155.23. For the bridge complete: New Jersey Steel and Iron Company, $2,596,750. Nearly a month has elapsed since these bids were opened, and the awards have not yet been made.

The Wampum Wire-Works, at Newcastle, Pa., were sold on the 14th inst. to T. B. Kettler, the former manager, for $5000. The works were built at a cost of $17,000.

The Damascus Bronze Company, of Pittsburg, Pa., is building a new foundry in Alleghany, in order to meet the growing demand for Damascus bronze. The foundry will be ready for occupation about July 1st. Natural gas will be used, and this will be the first establishment in Pittsburg or in the United States to use this fuel in journal-bearing metal.

J. P. Witherow, of Pittsburg, Pa., has closed a contract with the Spang Steel and Iron Company for two three-ton Clapp-Griffiths steel converters, which will have a daily capacity of about 200 tons. The plant is to be erected at the south end of the company's property at Etna, and is expected to be in operation about the latter end of October.

PROPOSALS.

The City Clerk of York, Nebraska, will receive proposals until May 26th, for the furnishing, erecting, and completing of a system of water-works having a capacity of one million gallons a day. The contract price is not to exceed $29,400.

The Common Council of Greensburg, Decatur County, Indiana, will receive proposals until June 17th for constructing water-works.

A. R. Buffington, Lieut.-Colonel Ordnance Commanding National Armory, Springfield, Mass., will receive proposals until June 14th for furnishing the following supplies during the fiscal year ending June 30th, 1887: Powder, gun-barrel and other steel, iron castings, coal, hardware supplies, paints, oils, chemicals, grindstones, etc.

J. C. Clifford, Captain of Ordnance Commanding Frankford Arsenal, Philadelphia, Pa., will receive proposals until June 17th for furnishing the following supplies during the fiscal year ending June 30th, 1887: Iron, cartridge copper, fuel, etc.

J. P. Rawley, Bristol, Tenn., wishes to buy a 25 to 40 horse-power steam-engine, and also some second-hand slate-working machinery, such as saws, planers, and rubbing-beds.

The Water-Works of Tonawanda City, N. Y., will receive proposals until June 1st for furnishing and laying two 12-inch submerged cast-iron mains across last channel of Niagara River; also 20-inch suction pipe.

The trustees of the water-works at Lima, Ohio, will receive proposals until May 26th for furnishing and erecting at the water-works pumping station in Lima, two pumping engines, each with capacity to pump three million gallons of water per twenty-four hours; also, two or more boilers, each approximately sixty-three inches in diameter and sixteen feet long, and all appliances and fixtures necessarily or customarily incident to a first-class pumping plant. Also for two pumping-engines, each with capacity to pump two million gallons of water per twenty-four hours, together with foundations and appurtenances.

William G. Gammon, Chairman, Rome, Ga., will receive proposals until June 7th for the erection of iron bridges across the Etowah River at that city, one of about 600 feet and the other of about 520 feet.

LABOR AND WAGES.

The Kentucky Legislature in final session on the 19th inst. passed the bill under which convicts will within thirty days be removed from labor in the mines and the long guard by State troops relieved.

The coal miners' strike in the Cumberland region, Maryland, which has lasted since March 8th, ended on the 18th inst., the miners resuming work at the old rate of 40 cents a ton.

The wages of the employés of the Union Foundry and Machine Company, of Catasauqua, Pa., have been increased 10 per cent, and a similar increase has been given the furnace laborers of the Crane Iron Company.

The Miners and Laborers' Amalgamated Association in Luzerne and Lackawanna counties have invited all the coal operators and mine-owners in both counties to a meeting to be held at Wilkes-Barre, Pa., on 22d inst., to discuss the eight-hour measure.

W. O. Wood & Co., the iron manufacturers of McKeesport, Pa. have voluntarily advanced the wages of their laborers 25 cents a day and all other employés 10 per cent.

Work has been resumed in the North Chicago Rolling-Mill Company's Works at Bay View, Wisconsin. Laborers previously paid $1.10 a day will now receive $1.40. The wages of boiler tenders, formerly $2 a day, will hereafter be $2.65. The works have been shut down since May 4th.

The miners at the Marshall coal mines, at Erie, Colorado, having been refused an increase of wages, drove the mine superintendent from town, took possession of the works, and refused to let any person enter the mine until their demand was granted. Sixty Pinkerton men have been sent to the scene.

A National Convention of miners was held in St. Louis, Mo., this week, to organize a "National District Assembly" of the Knights of Labor. The miners have made a demand upon their employers for the redress of a number of grievances, among which are mentioned the "pluck me" system, which enforces the miners to trade at the company's store or be discharged; the light weight practice; the pooling of operators to keep the price of coal up and wages down; and shorter hours and better pay.

TRANSPORTATION NOTES.

Preparations are making to construct a new railroad, called the Slate Valley Railroad, from Danielsville to Lockport, Pa., to connect with the Lehigh & Susquehanna Railroad. The road is to be for the convenience of slate operators in that section. Heretofore, the operators have had to cart their slate to the latter road, a distance of five or six miles, thus entailing great expense. The capital stock is $125,000.

The Missouri Valley, Bismarck & Southeastern Railroad has been incorporated, with a capital stock of $5,000,000. The northwestern terminus of the road will be in Buford County, Dakota, from which point it is to be constructed to Bismarck, Dak., thence southeast to a point near Watertown.

The Philadelphia & Reading Railroad Company has, it is reported, entered into an arrangement with the Baltimore & Ohio Company for the shipment of large amounts of anthracite coal to Baltimore and other points southward in opposition to the Pennsylvania road. This coal will be transferred from the Reading tracks at Birdsboro' to the Wilmington & Northern, and at Wilmington will be placed upon the new road of the Baltimore & Ohio.

The Beech Creek, Clearfield & Southwestern Railroad Company will be sold under foreclosure on June 4th, and reorganized within thirty days thereafter. The new company will be called the Beech Creek Railroad Company. About $200,000 will be expended this year in equipment and construction of branch lines to collieries. Notwithstanding the strikes among the coal miners, the net earnings for April were $36,000. The road will be bought in by ex-Senator Gazzam and Mr. Baer as a committee of the stockholders.

COAL TRADE NOTES.

COLORADO.

Improvements are making on the coal-banks at Marshall, Boulder County, that will increase the output to 1000 tons daily, should necessity demand it.

PENNSYLVANIA.

ANTHRACITE.

The Board of Mine Inspectors, which was in session at Wilkes-Barre, has announced that it will recommend for reappointment Patrick Blewett, of Scranton, as Inspector in the First District, and James Rodrick, of Hazleton, as Inspector in the Fourth District. The recommendations are considered as practically reappointments.

The Glendale coal breaker, near Scranton, was struck by lightning on the afternoon of the 20th inst., and destroyed. Loss, $35,000.

At Belmore colliery, operated by S. S. Bickel & Co., a fine vein of coal has just been struck. The tunnel is a long one, and has been driving for two years at a large expense.

Capitalists are negotiating for a lease of the Lehigh Valley's Reno Colliery, near Centralia. The mine was abandoned some time ago, but it is believed that large beds of coal undiscovered can be reached.

BITUMINOUS.

There is a movement on foot toward consolidating several mining companies near Berlin, Somerset County. The object of combining is to erect an extensive coke plant. The Eureka Company has an output of about 100 tons daily. Morgan & Co. have orders for all the coal they can get out. Their output is from 80 to 100 tons daily. At the Coleman mine, an opening has just been finished, and shipments of coal have begun.

COKE.

A coke syndicate, composed of all the independent operators in the Connellsville region, and backed by Pittsburg and Baltimore capitalists, is forming, it is stated, to fight the old organization. Baltimore men, who are taking an active interest in the movement are known to be representatives of the Baltimore & Ohio Railroad Company, and are believed to be investing the money of that company in the enterprise. The syndicate will control at least 10,000 acres of coal lands.

GAS AND OIL NOTES.

Exports of refined, crude, and naphtha from the following ports, from January 1st to May 15th:

	1886. Gallons.	1885. Gallons.
From Boston	1,707,268	2,354,169
Philadelphia	44,880,679	51,114,371
Baltimore	4,171,722	3,129,828
Perth Amboy	1,593,770	.....
New York	137,825,290	125,261,963
Total exports	190,178,729	171,860,331

DAKOTA.

In addition to the boom in mining stocks at Deadwood, another is rising in oil stocks. Several companies have recently been organized.

OHIO.

A contract has been made between the Ohio Gas Fuel Company and Mr. Fayette Brown, the receiver for Brown, Bonnell & Co., of Youngstown. The Ohio Company agrees to furnish gas for the operation of the mills during a period of three years. Receiver Brown is bound to pay royalties on the production of the mills as follows: $1.75 per net ton (2000 pounds) of finished iron and steel bars, plates, sheets, nails, links, bolts, and other articles manufactured from finished iron and steel, and $1.15 per gross ton (2240 pounds) of muck bar, scrap bar, iron and steel blooms, billets, and slabs made and shipped from the works, without being manufactured into finished products.

PENNSYLVANIA.

The Wheeling Gas Company has struck a good gas well near Taylorsville, Washington County. The well is in the center of a tract of territory embracing 6000

acres, and is seven miles nearer Wheeling than are the wells at Hickory. Other wells will be put down at once.

The Vandergrift No. 1, on the Baare farm at Washington, upon deeper drilling is reported to have developed into a phenomenal gusher. The well has been producing about 840 barrels a day. This well is said to be the fifth largest ever struck in this State.

TENNESSEE.

The Chattanooga Natural Gas and Heating Company has been incorporated by James Baylor Lewis, H. Wheeler, W. S. Marshall, and O. H. Pennock, at Chattanooga, to bore for natural gas, erect gas-works, etc. The company has leased 15,000 acres of land.

GENERAL MINING NEWS.

CONSUMERS' FORWARDING AND STORAGE COMPANY.—This company has been organized at Pittsburg. The character and object of the company is the building of wharves, and in connection therewith the building of vessels and boats for the purpose of carrying ore, coal, and other minerals, and the erection and maintenance of storage houses and yards for the reception, handling, and forwarding of such ore, coal, and other minerals to and from consumers thereof. The capital stock is fixed at $100,000, and the principal place of business is to be in the city of Pittsburg, with branch offices, wharves, and yards wherever the same may be necessary.

ARIZONA.

COCHISE COUNTY—TOMBSTONE DISTRICT.

TOMBSTONE MINING AND MILLING COMPANY.—By official reports, the production during April was 338 ounces of gold ; 54,588 ounces of silver ; and 127,788 pounds of lead.

ARKANSAS.

A successful run of ten tons of ore from Bear Mountain, 13 miles distant, of Moffet's smelter at Joplin, Mo., has recently taken place. The ore has all been taken from prospect-holes. The lowest estimate of the ore is $15.

CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

STANDARD CONSOLIDATED.—The statement for April shows :

Balance cash on hand April 1st, 1886...	$17,305.73
Bullion product bars—579 and 580.....	12,746.79
	$30,052.52
Expenses...	14,302.28
	$15,750.24
Bullion in transit bars—581 and 582.....	13,051.31
	$28,801.55

Negotiations are pending, looking to an agreement with the Bodie Company, by which the lower levels of the Standard will be pumped out, thus enabling the prosecution of work in the deeper levels. It is also understood that the expense account will be further reduced through a reduction in the cost of fuel.

HOMER MINING DISTRICT.

UNITED MAY LUNDY GOLD COMPANY, LIMITED.—This company has been organized in London with a capital of £200,000, 100,000 ordinary and 100,000 preference shares. The prospectus says : "This company has been established to purchase the May Lundy Gold mine and the two adjoining mines, known as the Lake View and Lucky Morton, and the improvements thereon, situated about twenty-seven miles from the town of Bodie.

"Prof. Thomas Price, of San Francisco, a mining engineer, has visited and examined it in company with Robert Walker, Esq., of Lethamhill, near Glasgow, one of the directors. It has also been recently examined by Captain Bickford Anthony, mining engineer, of Cornwall.

"Capt. J. H. Moyle, M.E., has also examined and reported upon the property, and states that the owner commenced mining operations on this property in April, 1880, and since that time he has made extensive developments, and opened out what is believed to be a larger quantity of rich-paying free milling gold ore than has ever been laid open and proved to exist in any property under one control or management.

"The ore milled has shown a uniformity of value seldom met with in a property of this magnitude, and from 6500 tons of unassorted ore (being all the rock taken out between the walls of the vein) the present mill, with 15 months' work, has produced £67,730."

A ten-stamp is on the property, and a new thirty-stamp is under contract to be at work by October next.

PLACER COUNTY.

CALIFORNIA IRON AND STEEL COMPANY.—The furnace of this company, at Hotaling, has been closed down, and the men have been notified to vacate the dwelling-houses. It is not believed that the works will be started up again for some years.

Iron mining and smelting has never been profitable on the Pacific coast, says the *Mining and Scientific Press*. The Clipper Gap mine had no trouble in marketing its product ; but when it came to compete in price with the imported article, there was no money in the enterprise. The disastrous fire a few years since was a bad set-back to the company, and the low price of iron since then has not given it an opportunity to reimburse itself for the loss. This was the only iron mine ever opened in this State and worked to any extent.

SAN BERNARDINO COUNTY.

RUNOVER.—Part of the machinery of the new 20-stamp at Calico is now on the site, and the work of erecting it is progressing.

SHASTA COUNTY.

IRON MOUNTAIN.—Operations at Iron Mountain have ceased for the present, all hands have been discharged, and the mill shut down. The cessation is said to be only temporary.

SIERRA COUNTY.

CLEVELAND.—This is a new mine, and is worked on a small scale, with an eight-stamp mill, which ran twenty days last month, producing $3500.

GOLD VALLEY.—This mine has been bonded to English capitalists, who will proceed to operate it on an extensive scale. The mine was worked a number of years ago, but did not pay, owing to the lack of proper facilities for reducing the ore.

MARGUERITE.—Legal trouble between some of the owners still prevents the starting up of this property.

YOUNG AMERICA.—During April, the mine yielded $27,620.

CANADA.

PROVINCE OF NOVA SCOTIA.

A correspondent writes us : The principal mines are working steadily. At Whiteburn, Queens County, prospecting has disclosed on the McGuire, Hall-Owen, and Armand properties a number of promising leads. Messrs. McGuire have built a five-stamp mill to test these veins, which appear to carry gold over a considerable tract of country. At Pleasant Valley, in Lunenburg County, Mr. McGuire and other Minnesota parties, in conjunction with a local interest, have built a ten-stamp mill, and are opening a six-inch lead said to run about two ounces to the ton.

BRITISH AMERICAN MANUFACTURING, MINING, AND MILLING COMPANY.—The Wiswell Electric Mining Machinery Company, of Boston, has erected one of its mills at Yarmouth, where the head-quarters of its operations in Canada are. It will have its mills manufactured by the Burrell Johnson Iron Company, and will supply them at short notice to any part of Canada. The company purposes taking interests in mining properties and aiding in their development, besides handling quartz to order at its mill in Yarmouth.

KEMPT GOLD MINING COMPANY, LIMITED.—The company has been organized with a capital of $30,000 to carry on the business of mining, quarrying, or otherwise searching for gold and other metals and treating the same. The chief place of business of the company to be at Yarmouth, in the County of Yarmouth.

PROVINCE OF ONTARIO.

One of the best salt-wells in the province has been struck at Wingham, at a depth of 1100 feet. The Canada Pacific Railroad will extend its line to this place, the company agreeing to do so on certain conditions, one of which was the establishment of salt-works.

COLORADO.

CLEAR CREEK COUNTY.

FREELAND.—Official reports give the product for April as follows : Gold, valued at $21,867.91 ; silver, at $4437.71 ; copper, at $21,887 ; total, $26,524.29.

PAY ROCK.—The recent strike is increasing in value.

PLUTUS.—During April, there were produced, as reported officially : Gold, valued at $8799.45 ; silver, at $5736.68 ; and copper, at $748.97 ; total, $15,285.10.

CUSTER COUNTY.

BASSICK.—This property was sold on the 13th inst., at sheriff's sale at Querida, for $60,000, to Mr. George H. White, of Michigan, who holds claims against the mine for about that sum. In sixty days from date, Mr. White will receive a title from Sheriff Hunter unless the other claimants redeem the property. The property is said to be in bad shape. The principal shaft, which is about 1400 feet deep, is filled with water nearly to the 600-foot level. Considerable capital will be needed to put the mine again in good condition.

DOLORES COUNTY.

COEBEC.—The C. H. C. vein has been struck at a depth of 265 feet.

LELIA DAVIS.—All difficulties have been settled, and work will be resumed.

GILPIN COUNTY.

HUBERT.—During April the net earnings amounted to $8116.30. Sinking the main shaft, which is now about 700 feet deep, will continue.

LAKE COUNTY.

From the Leadville *Herald-Democrat* we take the following :

AMERICAN MINING AND SMELTING COMPANY.—John Harrington, a former employé, has instituted a suit against the company to recover $20,000 for damages sustained by a powder explosion in the Queen mine. The suit is based on the allegation that the company failed to provide speedy means of escape.

HENRIETT.—The pumps have started up and are rapidly lowering the water. The lower stopes of the mine will now soon be accessible, and a regular output follow.

IDEAL.—This company, recently organized, has increased its capital stock to $1,500,000, shares $10 each.

IRON SILVER.—During April, as by official report, this company's production amounted to $56,133.55.

SILVER CORD.—The company has closed a contract with the Pueblo Smelting-Works for its ore output for the next six months. The improved condition of the mine promises to result in quite large shipments during this period.

DAKOTA.

CASS COUNTY.

It has been decided to locate smelting-works at Fargo. The ore will be conveyed from Lake Winnipeg by water.

LAWRENCE COUNTY.

CALEDONIA.—The official report, dated the 10th inst., shows that the drift from the bottom of the winze advanced 3 feet ; total, 7 feet. The south drift advanced 6½ feet ; total, 123 feet. Ore produced from the 425-foot level, 832 tons ; cave, 569 tons ; total, 1401 tons. The net bullion production for April was $19,441.37.

FATHER DE SMET.—Nothing was produced during April.

PENNINGTON COUNTY.

HARNEY PEAK TIN MINING AND REDUCTION COMPANY.—The shutting down of the mill is reported to have been done for the purpose of making improvements in the machinery. The Etta mine is to be further developed with tunnels and shafts, and steam drills are to be put up. The Rapid City *Journal* says : While the developments on the mine are such as to pretty thoroughly establish the fact that it is a valuable property, it is not of such a character as to admit of mining the pay ore at a rate sufficient to keep at work a mill of the capacity of that employed. The shafts, tunnels, etc., have evidently been run more for the purpose of learning what is in the mine than for the purpose of getting any thing out of it. The machinery has a capacity for reducing sixty four tons of ore a day of twelve hours, and with the facilities offered, that quantity of ore could not be supplied, not to speak of running day and night. The ore milled, so far as can be learned, was of a most satisfactory grade, yielding good pay in tin concentrates. Several experiments have been made in the machinery, some of which were only partially successful, and it is considered necessary to remedy some defects. The rolls used were chilled iron, and it is found advisable to replace them with steel rolls. The iron cracks and chips off. In the start, the attempt was made to pass the crushed rock through the screens without wetting ; but this was found to be unsatisfactory, and a stream of water was passed into the receptacle of the crushed rock before screening. This was found to be an improvement. The large quantity of

mica in the rock renders reduction and separation more difficult than it would otherwise be, and means will be devised for overcoming this difficulty. As stated, many things about the machinery were new, even to men who have worked in tin ores, and a number of changes which are found necessary will be made. In a short time, development-work on the mine will be resumed, and the development will be such as will be calculated to facilitate the mining of ore in large quantities. From the information at hand, it is safe to say the Etta has more than met the anticipations of the stockholders in the amount of tin concentrates turned out per ton of ore, and it has been practically demonstrated that, when opened in a manner to properly facilitate the breaking, moving, and reduction of ore, the Etta will be a paying tin mine.

FLORIDA.

Considerable interest is taken in the shipments of ore now making from this State. It is a brown hematite, and is said to lie so that it can be worked profitably. It is further stated that it may be questioned whether any other ore has been found in the South that invites steel making as this does. Mr. Alfred T. Brainerd, analytical chemist, of Birmingham, Ala., gives the following figures on a generous specimen that he has had :

Iron	57·730
Silica	1·810
Phosphorus	0·004

IDAHO.

According to the reports made by H. F. Wild, U. S. Assayer at Boise City, the production of lead, gold, and silver for this territory in 1885 was as follows : Lead, $639,069 ; gold, $1,338,686 ; silver, $3,027,116.

DONOVAN.—The mill erected by the Wiswell Electric Mining Machinery Company, of Boston, has started up, and is said to be working smoothly.

IDAHO GOLD MINING COMPANY.—This company, which owns mines in the Cœur d'Alene District, has awarded the contract for its new twenty-stamp mill, to the Excelsior Iron-Works, of Chicago. This mill will be one of the most complete in all its parts that has yet been sent to this section. The competition among the different foundries for this contract, it is said, was very active, and was finally awarded to the Excelsior Works, through the assistance of Mr. Samuel A. Murray, of Louisville, Kentucky, brother to the New York agent.

KING OF THE HILLS.—Work is progressing on this group near Bullion, and it is expected to tap the ore-chute with a tunnel within the next thirty days.

OVERLAND.—The shaft is down 200 feet and in a big body of ore. They are shipping fifteen tons a week of first-class ore, which goes from 90 to 100 ounces in silver and from 65 to 70 per cent lead. Heavy pumps are placed to free the mine of water.

ILLINOIS.

WESTERN DEVELOPMENT COMPANY.—This company has been organized at Chicago, with a capital stock of $50,000, to investigate and develop mining property. The incorporators are Eugene B. Moore, Bartin L. Keen, and William J. Wood.

LOUISIANA.

CALCASIEU COUNTY.

Northern parties are investigating the value of the sulphur bed at Calcasieu. Some fifteen years ago, a company began work there, erecting machinery, etc., but at a shallow depth quicksand was found, and all work ceased.

MEXICO.

The Mexican *Financier* reports the following :

ABUNDANCIA.—The new mill, at this mine, five miles west of Santa Rosa, is ready to start up. The mine is showing an abundance of fine ore.

BELEN.—At La Barranca, Francisco Flores is putting up new 20-ton concentration works on his silver mine, the Belen.

COBRIZA.—At Guadalupe, eighteen miles south of La Trinidad, the shaft of this mine passes beneath the ancient workings, and is in ore averaging 353 ounces of silver to the ton.

LA BLANCA.—A dividend of $500 per barra has been declared by this mine, of Pachuca.

REAL DEL MONTE.—The company is in a prosperous condition, and has just paid up its back dividends.

MICHIGAN.

COPPER MINES.

CALUMET & HECLA SMELTING COMPANY.—All arrangements have been completed for the erection of these new copper smelting-works on Torch Lake, and the work of excavating is pushed vigorously.

KEARSARGE.—This company has decided to increase the capital stock to $1,250,000.

IRON MINES.

The following statement, given by the Marquette *Mining Journal*, shows the amount of iron ore shipped from the ports of this district for the season of 1886, up to and including Wednesday, May 12th :

	Tons.
Marquette—Marquette District	43,191
St. Ignace	4,743
Escanaba—Marquette District	34,746
Menominee District	68,426
Grand total of lake shipments	151,106

VALLEY.—A syndicate has been formed to purchase this mine, which adjoins the Colby. The price is stated to be $150,000.

MISSOURI.

ST. FRANCOIS COUNTY.

IRON MOUNTAIN.—The company is shipping more largely than hitherto on contracts taken in November, with deliveries running forward to June. Some of its guaranteed low-phosphorus ore, taken from the "little" mine, has, says the *Age of Steel*, made a most remarkable record. On a contract for 10,000 tons for a Pittsburg furnace, seventeen shipments, representing over 8000 tons, have been made, and the analyses reported. Eight of the shipments showed only a trace of phosphorus, one only ·003 per cent, another ·004 per cent, and so on. The highest percentage of phosphorus in any one instance was ·017. The ore in question averaged about 64 per cent metallic iron. Investigations have been making regarding the supply of black ore on the property, the existence of which has been known to them all along by the outcrops. Four hundred and fifty feet from the outcrop, running around the top of the main mountain, a shaft was sunk, and ore of a thickness of 14 feet encountered. On the "little mountain," the ore has been driven into 232 feet, and the bed is somewhat thicker. It is the intention to begin work farther down in the valley in an experimental way, and, if practicable, operate regularly at and from the new point. This ore runs higher in phosphorus than some of the company's ores, but is still safely within the Bessemer limit, and would command a wide market. It is soft and smelts very easily.

MONTANA.

In our last issue, estimated figures were given of the production in this territory for 1885. In these, the gold and lead were given as gold only. The exact figures, as collected by Mr. Braden, Superintendent of the United States Assay-Office at Helena, state the production as follows : Gold, $3,409,400.23 ; silver, $9,171,983.70 ; estimated lead, $2,000,000 ; and copper, $9,000,000 ; total, $23,581,383.93.

LEWIS & CLARKE COUNTY.

EMPIRE MINING COMPANY, LIMITED.—Mr. F. L. Sizer, of Helena, has been appointed manager of this company at the mines.

MONTANA, LIMITED.—During April, the production amounted to $146,100 ; working expenses, $36,000. During the month, there have been extra expenditure as follows : Paid on account of purchase of adjoining properties, $11,000 ; paid on account of Frue vanners, $8000 ; paid on account of the fuel contract a further sum of about $5000. A United States patent for the Old Standard property has at last been granted.

SILVER BOW COUNTY.

ALICE GOLD AND SILVER MINING COMPANY.—We have had a number of inquiries concerning the reported purchase by the Alice Company of the Rising Star mine, as mentioned in our issue of May 1st. Some of those "in authority," both here and in Salt Lake, have denied the reported sale ; but from Butte we learn that the rumor was currently believed, and the price mentioned for this and adjoining properties was $165,000. The following items, from our Butte correspondent, may interest Alice stockholders :

"Since Messrs. Walker Brothers are the owners of the Rising Star—which cost them some $10,000 or $12,000—and control the Alice Company, we can understand how the report of the sale might very readily find credence ; for are not the circumstances almost precisely similar to those of the Magna Charta sale by Walker Brothers, owners, to their own Alice Company ?

"The Rising Star shows rich ore, and certainly the Alice will need it ; though in the 800-foot level of the Alice some high-grade ore has been struck in a small vein hardly 10 inches wide. The average yield of Alice ore during the past six months is said to have been $34 per ton of ore crushed, as against $27 average last year. Mining expenses are, however, said to be higher also.

"The Alice is threatened by a lawsuit for entering the Moose, a lode adjoining the Alice, and owned by Charles Larabie. Of course, there are two sides to the question. I understand Larabie claims over $100,000 for damages, while it is conceded by the Alice that they stoped the Moose from the 200 level upward to the surface for 216 square feet ; but they claim also that only one fifth was ore and four fifths waste. It will probably be adjusted."

The "controversy" referred to in the "rumor" we published on May 1st was apparently based upon the threatened lawsuit by Mr. Charles Larabie referred to by our correspondent.

BLUEBIRD.—The new machinery, which is to be furnished by Messrs. Fraser & Chalmers, of Chicago, will consist of two large Blake crushers, two revolving driers fed by automatic feeders, two 60-inch Howell & White cylinder roasters, 60 stamps, four pairs of Cornish rolls for salt, 24 combination amalgamating pans, 12 settlers, and 4 agitators. The power will be supplied by two pairs of boilers operating a compound condensing Corliss engine of 400 horse-power. The mill is to be in running order within five months. The ore will be conveyed to the mill by a tramway. The mine is situated at Burlington, and the developments so far made have been very favorable. The main shaft is 300 feet deep.

NEVADA.

GARFIELD, LIMITED.—This company has been formed in London, with a capital of £100,000 in 100,000 shares, to purchase and extend the workings of eight gold and silver producing mines in the Garfield and Silver mining districts, lying ten miles west of the Carson & Colorado Railroad. According to the promoter's statements, "The property is a going and dividend-paying concern, yielding from a five-stamp mill net profits of £2500 a month. By the additional machinery it is proposed to erect, the returns can be increased to £60,000 per annum. These mines have a reputation for their high-grade free-milling ores.' A report made upon the property by Mr. Milford, M.E., of London, says that "the ores extracted from the Atherton mines have always been high grade, the amount of gold predominating, and, as depth is attained, the value of the ore is becoming greater. He states the amount of ore in sight in this mine to be of the value of £162,000. The ores extracted from the Great Western mine are also high grade—90 tons averaged $742.29 a ton. The ore in sight is estimated at £128,000." He gives his estimate of the ore reserves at $201,956.75. The ore-reserves in the Belle mine, according to Mr. Hamilton, are estimated at $409,804.80. The remaining five mines have been sufficiently proved to show that they contain rich bodies of ore. Two samples assayed as high as $1253.90 and $176.76, while from a small opening in the vein, the owners took out ore yielding net profits of $71,933 ; also a shipment of 16 tons of ore assayed $649.03 a ton. The vender promotes the company to acquire the property as a going concern, and, in consideration of 70,000 shares and £20,000 in cash, the vender will convey to the company the whole of the mining property, with the valuable plant, chattels, and effects belonging thereto." The fame that such riches should give to a property has not reached New York, and it is barely possible that some of those statements may be based only on the view presented by looking at an ordinary "hole in the ground" through a London promoter's magnifying medium. Will some of our readers who are acquainted with the "bottom facts," or at least with the property, advise us ?

ESMERALDA COUNTY.

CANDELARIA WATER-WORKS AND MILLING COMPANY.—The sale of the property of the Victor Consolidated Mining Company to the Candelaria Water-Works and Milling Company is reported.

EUREKA COUNTY.

ALBION CONSOLIDATED.—The mines and other properties of this company were sold on the 14th inst., by the sheriff, under and by virtue of an execution issued out of the District Court in and for this county, to satisfy judgments against the corporation to an aggregate of over $60,000. According to the Eureka *Sentinel*, the Uncle Sam was sold for $37,000 ; Albion No. 1, $5000 ; Albion No. 2, $5000 ; Albion No. 3, $100 ;

Albion Consolidated, $100; Moss Agate, $100; Price, $500; Davis, $100; the improvements on the Albion and Uncle Sam, $1500; improvements on the Price and Davis, $1500; Albion hoisting-works, $1810; machine-shop, $100; lodging-house, $400; furnace plant, $3300; brick store, $500; Uncle Sam shaft-house, $1421.15—making an aggregate of $58,431.15. With the exception of three or four items, the purchases were by the Richmond Company. The above are subject to redemption any time within six months. To make such redemption would cost $68,948.65.

EUREKA CONSOLIDATED.—Official advices state that the new roasting-furnace for oxidizing speiss and the reduction of base ores seems to be a perfect success, and that things about the mine look much better. The new hoisting machinery is on the way to Eureka.

LANDER COUNTY.

MANHATTAN.—According to press reports, suit has begun in the District Court of Lander County by Patrick O'Rourke, administrator of the estate of Patrick O'Rourke, Jr., deceased, against the Manhattan Silver Mining Company for the sum of $100,000 for the killing of said deceased by the falling of the wall of the Boston mill and concentrator through negligence in not warning said deceased while lawfully traveling on the highway in front of said wall.

LINCOLN COUNTY.

BULLIONVILLE.—This company has set its Stetefeldt furnace to chloride the tailings and has begun leaching.

STOREY COUNTY—COMSTOCK LODE.

The Virginia City *Chronicle* reports the following:

CONSOLIDATED CALIFORNIA & VIRGINIA.—The statement for April shows that the gross bullion product for April, inclusive of the last shipment of $35,187.53, was valued at $138,923.48, including $62,748.39 in gold and $76,175.09 in silver. The April expenses on mining and milling accounts alone amounted to $126,000. Deducting the discount on silver from the face value of the bullion product ($138,923.48), the expenses for April exceed the receipts by about $4000. In fact, for two months past the mine has run behind, due to the low grade of ore and heavy discount on silver, etc. The ore worked at the Morgan mill, which averaged $13.70 a ton in the battery samples, only yielded $11.91 in bullion, while the ore worked at the Eureka mill, which averaged $13.94 a ton in the battery samples, yielded $12.27 a ton in bullion, the remainder of the metals passing off in tailings. It was officially stated that, after squaring up every thing, the company would have an actual balance on hand of about $30,000. The statement of the week ended the 8th inst. shows that 1046 tons of ore were shipped to the Morgan mill, and 1436 tons to the Eureka mill. The average value of the ore milled, according to assays from battery samples, was $13.88 a ton for that crushed at the Morgan mill, and $12.38 for that crushed at the Eureka mill. During the week, bullion valued at $35,187.58 was shipped to San Francisco.

GOULD & CURRY.—It is probable that the management will lease the California stamp mill if the ore-deposit proves extensive enough to warrant it.

WASHOE COUNTY.

WILLOW CREEK SILVER MINING COMPANY.—The company has been reincorporated by C. C. Stevenson, M. N. Stone, J. M. Douglass, F. C. Lord, and S. Moore with $5,000,000 capital stock. The Willow Creek mine is situated at Galena, near Steamboat Springs. A tunnel is now driving for the purpose of running out the ore extracted to the mill.

NEW MEXICO.

GRANT COUNTY.

NEW YORK & MEXICO.—A force is at work on this company's mines on Chloride Flat, preparing for extensive operations. A diamond drill has been ordered from the East, and the large tracts of untouched ground on these mines will be thoroughly explored.

GIPSY QUEEN.—This company has been organized with a capital of $1,000,000, 40,000 shares. The company's mines are located at Pyramid. A ten-stamp mill will be erected soon.

ROSE.—A new body of ore has been cut into on the east lower level. The ore is rich in native silver and nickel and arsenic. Hereafter, the mine will receive pay for the nickel in the ore, which it has not yet done.

SIERRA COUNTY.

It is stated that arrangements are making for the erection of works at Chloride for the treatment of the ores of that section by the Russell lixiviation process.

NORTH CAROLINA.

CHEROKEE COUNTY.

A. S. Hadaway is opening and will develop a mineral paint mine near Murphy.

McDOWELL COUNTY.

VEIN MOUNTAIN.—The company has recently acquired some new territory, and it now owns about 6000 acres. It is sluicing with two large nozzles, saving the pure gold in sluice-boxes and concentrating the "grit," to be worked in the stamp-mill. This company adjoins the Marion Bullion Company's lands.

MONTGOMERY COUNTY.

APALACHIAN.—At this mine, also known as the Coggins, a forty-stamp mill is to be erected.

STEELE.—The erection of the new stamp-mill is almost completed. A Golden Gate concentrator for concentrating the sulphurets is used. Two shafts are worked, one 65 and the other 135 feet deep.

MOORE COUNTY.

BRAY.—This mine has been purchased by Mr. W. A. Tilden, of New York. Preparations are making for active working.

DUNLAP.—This property, which consists of 500 acres on the banks of Bear Creek, has been purchased by C. C. Wade and W. B. Wright.

OREGON.

A correspondent of the Salt Lake *Tribune* writes from Cornucopia: The extensiveness of this region, having mines for fifty miles in nearly every direction, some of which have been worked for several years, offers special inducements for prospectors. Even in this immediate vicinity will probably be found as rich mines as have yet been discovered. The capitalist also will have a splendid chance for investment here this summer, as very many of the owners are very poor. The best point for reaching here is Baker City; in fact, it is the only one at present having a tri-weekly stage for here. The distance from Baker City to Cornucopia is about seventy miles, but a new road is already in operation that will lessen the distance to fifty-two miles. The proximity to farming regions makes provisions very cheap, while there is an abundance of wood and water for every purpose.

OREGON GOLD MINING COMPANY.—The company will erect a mill to work its ore and to mill and work the ore of other mines in the Pine Creek District. It proposes to sink a shaft on the Whitman to the depth of 250 feet, while the Alta will be worked as rapidly as possible.

PENNSYLVANIA.

The property of the Mercer Mining and Manufacturing Company will be sold June 16th at Greenville, under foreclosure of a mortgage dated September 1st, 1880.

UTAH.

BEAVER COUNTY.

HORN-SILVER.—According to the Salt Lake *Tribune*, a strike has been made of an exceedingly rich streak of beautiful ruby and horn-silver ore. The mine has shipped and sold 650 tons of good ore since the resumption of shipments, about six weeks ago.

BEAVER AND MILLARD COUNTIES.

DICKERT & MYERS SULPHUR COMPANY.—At a meeting of this company, C. F. G. Meyer, of St. Louis, was elected President; R. L. Scannell, of Salt Lake, Vice-President; Ferdinand Dickert, General Manager, Secretary, and Treasurer; and the above, with H. C. Parke, of Detroit, and Daniel Myer, of Cleveland, form the board of directors. The condition of the property, which is situated at Cove Creek, is good. So far, the company has made flower sulphur by first refining and casting in blocks, then crushing and grinding. Machinery is now going in to produce sublimated sulphur, which is an entirely different process, and consists in heating until thrown up in the form of vapor, and crystallizing and forming on the chambers. This process will soon be in operation.

VIRGINIA.

SHENANDOAH COUNTY.

MANGANESE AND IRON COMPANY.—Three shafts have been sunk on the company's property at Mine Run Furnace, where working goes on day and night. The ore is said to be of the highest grade.

WISCONSIN.

The boom in the Gogebic iron range, to which we have referred in previous issues, continues. Several large sales of mines have recently been made, and new companies organized, which are now pushing development-work vigorously. This season's output will no doubt show a considerable increase, as compared with last year. The ore is very desirable for furnace work. Mr. John E. Burton, of Milwaukee, is one of the pioneers of this region, and much credit is due to him for the introduction of outside capital. A circular just issued by him gives the price at which some of the stocks have been sold to *bona-fide* buyers for cash, or else a price that has been offered in cash and owners have refused. All shares are $25 face value:

Aurora (and Vaughn)	$12.50	Norrie	$23.00
Iron King	8.00	Puritan	6.00
Bonnie	4.50	Ironton	6.00
First National (including Geneva)	3.50	Smith	5.00
Blue Jacket	3.50	South Nimikon	1.00
Anvil	4.00	Caledonia	3.00
Valley (*joining Colby*)	3.50	Laura	2.75
Pontine (Burton)	3.00	West Ryan held at	3.50
Montreal (and Sec. 33)	4.00	Badger State	2.00
Ashland	15.00	Pence	5.00
Germania	10.00	Gogebic	3.00
Nimikon	3.00	Iron Prince	2.00
Kakagon	2.50	Ironsides	2.50
Superior	3.80	Iron Chief (Ascherman)	5.00
Odanah	7.00	Crown Point	1.00
Ryan	4.00	Amazon	5.00
Moore	2.50		

WYOMING.

ALBANY COUNTY.

The buildings connected with the Soda Refining Works at Laramie City were destroyed by fire on the 15th inst.

MARKETS.

NEW YORK, Friday Evening, May 21.

Silver.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
May 15	44¾	98	May 19	44¾	98
17	44¾	98	20	45	98⅛
18	44¾	98	21	45 5-16	99¼

The London market has rallied to the extent of about one half the decline of the past week, and our market has correspondingly advanced; but we are without advices as to whether the cause of this recovery is likely to operate toward a further strengthening of prices.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 3 per cent. During the week, the bank gained £93,000 bullion; and the proportion of its reserve to its liabilities was raised from 37⅛ to 37 5/16 per cent, against 50 1/16 per cent at the same date last year. On the 20th inst., the bank gained £6000 on balance. The weekly statement of the Bank of France shows a gain of 17,025,000 francs gold and a loss of 3,900,000 francs silver.

Copper.—The Calumet & Hecla has created as great a sensation in the trade as if an anarchist bomb had fallen in the camp. It has made contracts with consumers for their supplies up to the end of July at ten cents a pound.

This figure was wholly unexpected, 10½c. having been considered the lowest figure thought of by others in the trade.

This decision of the company was kept a profound secret until yesterday, and even as we write, it is known to but few outside of the buyers. Lake copper at 10 cents!! is not only unexpected but overwhelming to many other producers, and the necessity for so low a price being denied with absolute unanimity outside of the Calumet & Hecla office, the question is asked everywhere, "Why was it done?" We frankly confess we are not in the secret, and "give it up;" but it is interesting, and perhaps instructive, to hear some of the explanations given. "It is to punish the Quincy and some others that left the Calumet & Hecla to fill the unprofitable foreign contract a year ago, and since the Calumet & Hecla can produce cheaper than any other mine in the world, it is going to 'make them sick' and bring them into a new foreign pool." Another says: "They want to 'sicken' the companies that are selling copper at 'half a cent or three quarters of a cent below Lake,'" meaning chiefly the Parrot.

"What does it mean for the future of prices?" is a common question.

The offending company itself has a much simpler explanation, and one that is reasonable. "We have copper and we want money." "We propose to sell our copper mostly at home, and the effect of our price on others does not concern us. No, we can not tell whether its effect will be to

unite the Lake producers in their foreign sales." The other producers must necessarily either sell or hold for something to turn up, and perhaps at the end of the two months the something might be another sale by Calumet & Hecla. "We can see no improvement in the near future in the market. Buyers have been holding off and stocks accumulating." Such, in substance, is the view of the case taken in the company's office. Outsiders, who, of course, can not know the facts as well as the principals, say the company could have contracted for its copper to go abroad at a better figure than 10 cents. Another, who sells a good deal of copper says: "I would have undertaken to place all they have sold at 10½ cents." Another says our correspondents have been asking us, "What is the matter with the Calumet & Hecla May dividend?" This would confirm the "we have copper and we need money."

No quotations can be given for other brands, and even the other Lake companies refuse to meet the cut.

If it were believed that the Calumet & Hecla would continue to sell at 10 cents, no doubt many producers would shut down their works. Arizona and Montana and many of the Lake mines can not make ends meet with "Lake at 10 cents," and it is possible this contingency may not have been wholly outside of the reasons for the action of the great bear. The market is wholly unsettled, though the amount sold can not have exceeded, if it reached, eight million pounds.

Chili Bars were quoted in London to-day £39 17s. 6d., due probably to the news of this break.

Messrs. Merton estimate the production of copper in 1885 at 221,715 tons, or 4200 tons more than in 1884.

The following extracts from English circulars of May 6th and 8th show the state of the European copper market.

Messrs. Vivian, Younger & Bond, London, May 6th, say:

"The Chili Bar market has, with some trifling fluctuations, declined during the month from £41 10s. to £40 5s. cash. The fears of speculators have induced much persistent selling of Chili Bars throughout the month, and the returning dullness of trade in metals, combined with some accidental circumstances, having increased the visible supplies, prices have given way.

"America has sent us 6100 tons less copper this year than in the same time last year; but either France has gone out of stock, or her trade has been so very bad, or partly both, that the reduction of her operations has more than compensated for this falling off in shipments from the States. Still there are many evidences that come before those closely connected with the trade that go to show that copper is gradually working its way into a more healthy condition in the face of all the fluctuations in price caused by bulls and bears.

"The smelters reduced the price of copper sheets on the 3d inst. £3 per ton, making strong sheets £50 per ton.

"The following are some of the sales of furnace material:

"300 tons Yellow and Ruby Quebrada ore at 8s.@ 8s. 3d. per unit; 1000 tons Yellow Portuguese ore (low produce), at 6s. 9d.; 200 tons Cape ore at 8s. 4½d.; 120 tons Kurilla ore at 8s. 3d.; 180 tons Mexican ore (carbonate) at 8s. 6d.; 1100 tons Anaconda Matte (to arrive) at 8s. 6d.; 420 tons Chilian Regulus at 8s. 6d.; 350 tons Cueva de la Mora Precipitate at 8s. 3d., etc."

Henry R. Merton & Co., London, May 8th, say:

"The transactions in furnace stuff have been very small, namely: 450 tons Mason's Precipitate, at 8s. per unit; 180 tons American Matte, at 8s. per unit.

"The following figures are of some interest:

	1880. Tons.	1881. Tons.	1882. Tons.
Copper production of the world	153,057	161,711	177,823
Average of visible supplies of copper in Europe on the first of each month	64,589	59,703	51,426
Average price of Chili Bar copper on the first of each month, £ per ton	63 1 3	61 1 3	67 0 0
	1883. Tons.	1884. Tons.	1885. Tons.
Copper production of the world	197,936	217,483	221,715
Average of visible supplies of copper in Europe on the first of each month	50,111	45,912	55,220
Average price of Chili Bar copper on the first of each month, £ per ton	63 9 6	54 15 5	44 0 6

Visible supply of copper in Europe on the first of May, 1886, 61,069 tons

Tin.—This market is still higher than a week ago, sales on the Metal Exchange for June, July, and August tin having been made to-day at 21·20@21·15c., and spot is quoted 21·40@21½c., while London cables quote spot tin £95 15s.; three months, £96 15s. The demand is moderate.

Messrs. Vivian, Younger & Bond, London, May 6th, say:

"At the Billiton sale in Batavia, on the 28th ult., about 22,000 slabs realized an average of fl. 64 per picul, equal to about £94 10s. per ton laid down in Holland. Early in the month, the market declined from £93 10s. to £92 5s., under rather free selling, but soon rallied to £93 10s., and on advices of very moderate shipments for the month, advanced to £94 10s. cash, and £95 5s. three months. The improvement in the statistical position is again very marked, and unless consumption falls off, of which there seems no prospect, this improvement seems likely to continue. The April shipments are advised as follows: Straits to London, 775 tons; to America, 275 tons; Australia to London, 525 tons; to America, 50 tons; London and Holland to America, 330 tons. The deliveries for the month from London warehouses were 1474 tons; from Holland, 608 tons.

"The stock of foreign tin in London and Holland is thus estimated:

	1886. May 1st. Tons.	1885. May 1st. Tons.	1884 May 1st. Tons.
Foreign tin in London	6,087	5,688	6,108
Banca tin in Holland	643	1,458	921
(in company's hands)	2,255	3,707	2,778
Billiton tin in Holland	539	1,251	1,303
	9,524	12,104	11,110
Quantity of tin afloat for Europe	3,400	4,200	4,200
Quotations on the same dates being for Straits, per ton	£94 10s.	£79 10s.	£85

Lead.—London cables quote Soft Spanish £12 10s., which is 10s. below the rate of a week ago, and as a consequence the market here has declined in tone, if not in actual price. The agent of the Richmond Company is, we understand, offering lead from the dock at 4·70c., while the agent of the Omaha Works has practically withdrawn from the market during the past three or four days.

Very little lead has been sold, and as foreign can now be laid down here at about 4·80c., and some has been sold at 4¾c., the present indications are not favorable for any higher prices than 4·70c. Even that figure may be lowered temporarily.

We quote manufactures: Sheet-Lead, 6@6¼c. net, and Lead Pipe, 5·40c. net. Shot, Buck, and Chilled, 6c., in 25-pound bags.

Messrs. Everett & Post, of Chicago, telegraph to us as follows to-day:

The market remains about the same, if any thing a shade firmer. However, there is but little doing, and demand from hand to mouth only. Offerings are very light. Sales for the week sum up over 300 tons, at 4·62½@4·65c.

Messrs. John Wahl & Co., of St. Louis, telegraph to us as follows to-day:

There is a fair business, with no change in prices, and no perceptible change in the spirit of the market. We may quote both Hard and Soft lead 4·57½@ 4·60c. Sales only of a retail character at these figures. Holders are firm, but buyers are scarce.

Spelter.—The market remains without notable change. We quote 4·50@4·75c. for Missouri, and 6¼@6½c. for New Jersey. Foreign Spelter is quoted 4·80@4·85c.

New Jersey Zinc Oxide is quoted 3¾@4¼c.

Silesian Spelter in London was quoted to-day £14 2s. 6d., as a week ago.

Sheet-Zinc is worth 4½@5·60c.

Antimony.—This market is quiet at 8½@8¾c. for Hallett's, 9c. for Cookson's here, and in London £33 10s. for Hallett's.

Nickel.—We quote 70c. nominal,

Bismuth—Is quoted at $2@$2.25 a pound, the latter price for small quantities.

Aluminium—Is quoted at $1@$1.25 an ounce.

Quicksilver.—Messrs. French & Smith, London, May 6th, report:

There was a good demand for China, and importers advanced the price to £6 5s. per bottle. From second hands it may be bought at 2s. 6d. per bottle less.

The imports and exports for January to March three months) were, as per the Board of Trade returns:

	1886. Lbs.	1885. Lbs.	1884. Lbs.
Imports	1,812,225	1,504,025	2,255,315
Exports	1,426,897	776,529	953,002

Quotations of Sundry Minerals and Mineral Products.

Magnesium—This metal has declined enormously in value. A few years ago, it was worth $3.50 an ounce, while to-day it can be purchased at $1 an ounce.

Arsenic shows no improvement. The stock in the hands of importers is unprecedentedly large, with only small purchasers. Prices to arrive, 1¾@1⅞c., as to brand and quality. We hear of sales of Deloro, 25 kegs, at 1⅞@2⅛c., also of car-load of 116 kegs, shipped directly from the mine to St. Louis, on private terms.

The arrivals of Dry Paints are only small during the past week, with a good demand from dealers all over the country, drawing heavily on stocks in store. Among the arrivals this week we note 200 bbls. of Hoyle, Robson & Co.'s Venetian Reds, per SS. Kouno, also 10 bbls. each of their Indian Red and Iron Oxide, and 100 bbls. of Hoyle, Robson & Co.'s Portland Cement to Philadelphia, by SS. Coronilla, which was sold before arrival. The general trade is active.

Acid—Sulphuric, 60°, 1c; 66°, 1·1@1¼c.; Muriatic, 18° 1¼@1½c.; 20°, 1½@1¾c.; Nitric, 36°, 5½c.; 42°, 7@ 7½c.
Alkali—36 p. c., 1·25c.; refined, 1·40c.
Alum—p. lb., lump, 1¾c.; ground, 1⅞c; p. ton, Liverpool, lump, £5 10s.; Sulphate of Alumina, £4 12s. 6d.
Ammonia—Sulphate, 3¼c; Carb, 9c.
Arsenic—white, 2c.; red, 6¼c.; p ton, Plymouth, £8 10s.
Asbestos—American, $20 p. ton, c. i. f. Liverpool; best Italian, p. ton. £20.
Asphaltum—Trinidad
Barytes Sulph.—Am. prime white, p. ton, $18; foreign, $20; Off color, $13; Carb lump $30 p. ton; No. 1, casks, Runcorn, p.ton. £3 7s.; No. 2, bags, £2.
Bleach—over 35 p. c., 1½@1·65c
Borax—p. lb., 6@7½c.; Refined, p. ton, Liverpool, £30.
Bromine, lb., 37c.
Cobalt Oxide—p. lb., $2.35.
Chalk—4c.; precipitated, 5@7c.
China Clay—English, $13.50@$17; Southern, $11.50.
Chrome Yellow—6@18c.
Cobalt Oxide—2·25c.
Copper, Sulphate, English Wks., p. ton, £15; Precipitate, p. unit, 8s. 6d.
Copperas—common, ·60c.; best, 1¼c p. lb.; p. ton, in casks, Liverpool, £42 6s.
Emery—grain, 3½c.; flour, 2¼c.
Feldspar, ground, $15 p. ton.
Kainit—ton, $7.15@$7.60.
Lead—Red, 6@6¼c.; White Am. in oil, 6½@7c.; English, 8½c.
Litharge—flake, 6c.; C. i. f. Hull, £14 5s.
Magnesite—Syrian, p. ton, $15.
Magnesium, p. oz., $1.
Manganese—lump, 70 p. c., c. i. f. Liverpool, £3 2s. 6d.; 1s. 6d. per unit, up or down.; Ground, p. ton, £6
Mineral Wool—1@3c. p. lb.
Paints—Venetian reds are all 336 lbs. net in each barrel. *Venetian Red*, English, H. R. & Co.'s (M), $1.40; H. R. & Co.'s (H), $1.20; H. R. & Co.'s (F. V. A.), $1.12½; American Venetian Red, 1¼@1¾c.; *Spanish Brown*, English, 1@1¼c.; American, ⅞@1c.; English Indian Red Super, 6@7c.; English Persian Red, 16c.; English Turkey Red, 6c.; English Tuscan Red, 8c.; English Rose Pink, 9c.; English Carome Yellow, 8@18c.; English Drop Blacks, 8@12½c.; *Ochers*, French, 1½@ 5c.; American, 1@2c.; *Umbers*, Turkey Burnt, 3@4c.; Turkey Raw, 2½@3c.; Am., 1½c.; *Sienna*, Italian Burnt, 6@7c.; Italian Raw, 5@6c.; Am., 2@3c.; Ferronite, ground magnetic iron, 3½c lb; in oil, 5·20c. net.
Phosphate Rock—p ton, $8; ground, $10.50.
Phosphorus, lb., 70c.
Plumbago—Ceylon, 4@5c.; American, 6@9c.; London, per cwt., £10@£15.
Potash—Bromide, 34@42c.; Chlorate 16½@17c.; Carb. 4½@5½c.; Caustic, 7½@8c.; Iodide, $2.65.; Muriate 1¾c.
Pumice-stone—Selected, 2¼@2¾c.; Original, cks., 1⅜@ 1½c.; Lumps, 3@5c.; powdered, 2@3c.
Pyrites—Non-cupreous, N. Y., per unit, 10@12c.
Quartz, ground, p. ton, $18.
Quicksilver—44c. p. lb.; London, £6 5s. flask (75 lbs.).
Rotten stone—powdered, 3@4½c.; lump, 5@6c.; England powder, £3; lump, £4.
Salt—Liverpool ground, 70c.; Turk's Island, 25c.
Salt Cake—p. lb., ·65@¾c.
Saltpeter—crude, 4¾c.; Refined, 6@8c.
Soda Ash—Cake, 48 p. c., 1·35c; Caustic, 48 p. c., 1·35c. 70 p. c., 2·45c.; Sal, English, ·75c.; American, ·90c.
Sulphur—Roll lb., 2⅜c.; Flour, 2⅝c.; Virgin Rock, 1½c Brimstone, crude, seconds, $22; thirds, $21 p. ton.
Talc—Ground French, 1¼c.; Domestic, ·6c. lb.; per ton, $15; c. i. f. Liverpool, p. ton, £4 5s.
Vermilion—American, 8@30c.; English, 55c.
Vitriol—blue, ordinary, 4½@4¾c.; extra, 4¾c.
Zinc Oxide—American, dry, 3½@4c.; Liverpool, £17 10s.; Sulphate, ton, £8 9s.

Importations at New York.

Antimony—Star, 125 casks, order, Newcastle; 25 casks, order, from London.
Alkali—46 casks, order, from Newcastle.
Asphalt Mastic—1500 pkgs., E. Thiele, from Bremen.
Barium, Bioxide—8 casks, Ernest & Drever, from Havre.
Barytes—203 casks, Gabriel Schall, from Bremen.
Coal—1614 tons steam coal, order, Newcastle.
Chalk—950 tons, order, from London.
Cobalt, Crude—20 kegs, Stallman & Fulton, from Hamburg.
Copper Ore—1445 tons, order, from Tucacas.
Copperas, Green—248 casks, order, from Swansea.
Cement—1120 casks, Baetjer & Meyer, from Bremen; 4166 casks, order, from Bremen; 1000 casks, Marcial & Co., from London; 2750 casks, Merchants' Bank of Canada, from London; 300 casks, Mathew Taylor, from London; 6040 casks, order, from London; 2300

casks, E. Thiele, from Rotterdam; 44 bbls., Hugo Muller, from Hull; 1000 casks, without bills of lading, from London; 50 bbls., order, from Stettin; 580 casks, Gabriel & Schall, from London; 4503 bbls., order, from Hamburg; 541 casks, Merchants' Bank of Canada, from Bremen.
Ferro-Manganese—A quantity Crocker Brothers, from Liverpool.
Graphite—12 casks, E Berolzheimer, from Bremen.
Iron—Pig, 350 tons, G. W. Stetson, from Glasgow; 50 tons, Richard Irwin & Co., from Glasgow; 400 tons, Crocker Brothers, from Glasgow; 455 tons, Naylor & Co., from Glasgow; 100 tons, order, from Glasgow; 1800 tons, Drexel, Morgan & Co., from Bremen; 200 tons, James Williamson, from Glasgow; 475 tons, without bill of lading, from Glasgow; 280 tons, Crocker Brothers, from Liverpool. Oxide, 115 casks, order, from Newcastle; 10 lbs., Heller & Metz, from Liverpool. Spiegeleisen, 520 tons, Crocker Bros., from Liverpool; 600 tons, order, from Liverpool; 250 tons, order, from Antwerp; 300 tons, order, from Amsterdam; 340 tons, order, from Flushing; 40 pgs., Geisenheimer & Co., from Glasgow; 485 tons, order, from Newcastle; 300 tons, order, from Rotterdam; 25,400 kilos., order, from Rotterdam; 330 tons, order from Glasgow.
Kainit—522,600 kilogs., order, from Hamburg.
Lithographic Stones—3 cases, order, from Antwerp.
Ocher—80 lbs., order, from Glasgow; 30 lbs., Henderson Brothers, from Glasgow.
Phosphorus—50 cases, C. Pfizer & Co., from Swansea.
Salt—3815 sacks, Todd & Co., from Liverpool; 5959 sacks, order, from Liverpool; 10,732 sacks, Middleton & Co., from Turk's Island; 2275 sacks, S. Thompson, Nephew & Co., from Laguayra.
Saltpeter—496 bags, order, from Calcutta; 223 bags, J. B. Moors & Co., from Calcutta.
Silica—38 casks, order, from Glasgow.
Soda Ash—1485, order, from Liverpool; 91 casks, J. L. & D. S. Riker, from Liverpool.
Steel Blooms—288, order, from Antwerp.
Steel Slabs—880 steel slabs, R. F. Downing & Co., from Glasgow.
Steel Blooms—77, order, from Bremen.
Steel Billets—803, order, from Antwerp; 48, order, from Bremen.
Crucible Steel Tires—207, order, from Antwerp.
Sulphur—1100 tons, order, from Ligata.

ENTERED FOR CONSUMPTION.

Acids—3 casks, from Rotterdam.
Arsenic—60 casks, from Hamburg.
Asphaltum—300,000 kilos., from Antwerp; 5 bbls., from Vera Cruz.
Asphaltum Mastic—1500 pcs., from Bremerhaven.
Asphalt, Crude—1100 tons, from Trinidad.
Barium, Nitrate—10 kegs, from Bremen.
Bitumen Substance—1800 kegs, from Bremen.
Brimstone, Crude—1,365,000 lbs., from Sicily; 500 tons, from Girgenti.
Cement—54,725 casks, from London; 8373 casks, from Bremen; 1000 bags, from Liverpool; 4490 bbls., from Hamburg; 2300 casks, from Rotterdam; 1500 casks, from Antwerp.
Chalk—950 tons, from London; prepared, 15 cases, from Hamburg.
Iron Ore—750 tons, from Almenia.
Oxide—10 bbls., from Liverpool.
Pig—2,262,400 pounds, from Glasgow; 2,430,400 pounds, from Liverpool.
Iron, Spiegeleisen—1,843,200 pounds, from Antwerp; 53,522 pounds, from Glasgow; 1,843,200 pounds, from Liverpool; 1,081,920 pounds, from Newcastle; 661,500 pounds, from Rotterdam.
Kainit—416,560 kilos., from Hamburg; 1,152,124 pounds, from Hamburg.
Lead—4249 pigs, from London; 7750 pigs, from Marseilles
Phosphates, Ground—995 casks, from Antwerp.
Rotten-Stone—1 cask, from Liverpool.
Saltpeter, Crude—1235 lbs., from Calcutta.
Soda Ash—2890 casks, from Liverpool; 174 tcs., from Liverpool; 434 casks, from Newcastle.
Soda, Arsenate—10 casks, from Liverpool.
Steel—182 pgs., from Liverpool.
Tin—965 slabs, from London.
Type Metal—1908 ingots, from Swansea.
Uranium, Oxide—1 case, from Bremen.
Zinc, Dry Oxide—200 bbls., from Havre.
Zinc, Oxide—100 casks, from Rotterdam; 150 casks, from Stettin.
Strontia, Nitrate—50 kegs, from Hamburg.
Talc—30 pgs., Brown Bros., from Glasgow.
Tin—4677 ingots, without bills of lading, from London; 712 slabs, order, from London; 455 slabs, Gilfillan, Wood & Co., from London; 700 ingots, order, from Newcastle.
Zinc Dust—40 cases, J A. & W. Bird & Co., Bremen; 150 bbls. oxide, order, from Copenhagen.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 21.

Iron Ore.—We quote at Cleveland, Ohio:

No. 1 Specular and magnetic Bessemer ores per ton	$6.25
No. 1 Specular (non-Bessemer) ores per ton.	5.50
Bessemer Hematites	4.75@ 5.50
Non-Bessemer Hematites	$4@$4.50

In New York, foreign ores are worth 9@10c. per unit, according to quality.

Pig.—This market is dull. The labor troubles continue to lessen the demand, and manufacturers who ask to have shipments on their contracts deferred are more numerous than they were a week or two ago.

The best brands of iron are held firmly at the old prices, but poorer irons would have to be shaded quite heavily if a sale of any quantity were to be forced. Provincial markets are also reported as weaker, though prices are generally unchanged.

Scotch Pig.—There is nothing worthy of note in this market. We quote as follows: Coltness, $20; Gartsherrie, $19; Summerlee, $19.50; Dalmellington, $18@$18.75; Langloan, $19. Freights 4s. Cables to the Metal Exchange quote: Coltness, 47s.; Summerlee, 46s.; Langloan, 43s. 6d; Gartsherrie, 42s. 6d.; Glengarnock, 42s. 6d.; Dalmellington, 40s. 6d.; Eglinton, 38s. 6d.; Warrants, 38s. 3d.; Middlesboro', No. 3, 29s. 6d.

Bessemer Pig.—Quite large arrivals have come in during the week, and the iron is sold, though at low figures that leave no profit to importers or makers. We quote Domestic at $18 at the furnace, and Foreign, ex ship, $18.50@$19.

Spiegeleisen.—We quote English and German, $25.25@$26. Eighty per cent ferro-manganese is quoted at $65@$66. About 4000 tons of foreign Spiegeleisen arrived at this port during the past week.

Structural Iron and Steel.—Prices remain unchanged. We quote Angles, 1·90@2·10c. delivered; Tees, 2·35c.; Iron Beams and Channels, 3c. for American from dock. Steel Angles, 2·35@2·40c.

Plate Iron.—Common Tank, 2@2·15c.; Refined, 2¼c.; Flange Iron, 3¼@3·5c.; Extra Flange, 4@4·25c.

Bar Iron.—Refined we quote at 1·75@1·90c.; Common, 1·55@1·70c. Store prices are ·10@·20c. higher.

Steel Plates.—We quote 2½c. for Tank; 3@3¼c. for Boiler and Ship Plates; 3¾@4c. for Flanges; 4¼@5¼c. for Extra Flange and Fire-Box Plate.

Merchant Steel.—American Tool Steel, 9½c.; special qualities, 11@18c.; Crucible Machinery, 4½@5½c.; Bessemer and Open-Hearth Machinery, 2½@2¾c.

Old Rails.—We quote Tees and Double-Heads offered at $19.

Steel Rails.—We hear of sales of 5000 tons in one lot, and a few smaller lots at $34.50@$35, while one Eastern mill holds at $36, having nothing to sell. There are quite larger orders in the market. There are still very low offers made of foreign rails, though we do not hear definitely of any orders having gone abroad.

Scrap.—There is very little doing, and we quote $18.50@$19 in favor of buyers.

Philadelphia. May 20.

[From our Special Correspondent.]

As compared with the previous week, a slight improvement has been developed in the iron trade, though it has not been shared in by the better brands of iron. No. 1 iron has been selling at $18@$18.50, and Forge iron at $15.50@$16. There are a good many buyers who would like to place their orders, but makers and holders are not prepared to meet them half way. All the good brands are held where they have been, namely, at $18.50@$19 for No. 1; $17@$17.50 for No. 2; and $16.50@$17 for mill irons. The makers of special brands claim they have nothing to offer, and will offer nothing excepting where their own prices are paid. The disposition to shade prices is shown in inferior irons only. One large lot was sold this week at about $15.25 delivered, and it is understood that some more business will be done on a large scale at about this figure. Business is clearing up and the trade is in a little better heart.

Foreign Iron.—In the absence of business of consequence, quotations are repeated at $19 for Bessemer, and $25@$26 for Spiegeleisen.

Merchant Iron.—On account of the retail way orders have been coming in for several weeks past, the amount of business at the mills is beginning to improve. A month ago, a good many buyers had their contracts placed, but now nearly all of them are out or nearly so, and are, therefore, coming into the market every day. Offers have been made this week for good round lots of assorted bars at $1.70@$1.80. The increased cost is helping to keep prices very firm in merchant bars and in all kinds of iron. Stores report a better distribution this week, and the agents of some interior mills have picked up some good orders for medium and common.

Sheet-Iron.—Three sheet-iron makers in the Valley report an influx of small orders at card rates nearly; but in a general way, the trade is at a stand-still. Builders report here that at least $5,000,000 worth of building has been lost this year on account of strikes.

Merchant Steel.—The makers of merchant steel have had a quiet week, though all the mills are making full-time.

Skelp Iron.—Negotiations are in hand to-day for one or two large lots of skelp iron; card rates, 1·80@1·85c.

Plate Iron.—The demand for plate iron continues good, although the aggregate of this week's business does not come up to last week's. Orders have been taken at 1·90c. for Plates; Tank is worth 2c.

Wrought-Iron Pipe.—The good demand heretofore reported keeps up for both wrought-iron pipe and cast pipe, and deliveries are hastened forward on some large contracts.

Structural Iron.—The makers of structural iron are not able to report the closing of some business submitted a week or two ago, although the mills are everywhere full of orders. Quotations for Angles are 1·80@2c.; Beams and Channels, 3c. Taking one week with another, a good deal of bridge iron is contracted for.

Steel Rails.—The business in steel rails foots up 50,000 tons for the week, or will by Saturday, and probably considerably more. Quotations run from $34.50@$36.

Old Material.—In old material there is no particular movement.

Pittsburg. May 20.

[From our Special Correspondent.]

We have to report a very unsettled market. It will take very little to give prices a downward direction in pig-iron, in spite of the confident assertions of makers, both North and South, that production is no more than equal to current requirements. Since our last report, business has been remarkably quiet, and will probably remain so until the railroad builders make a new move. The rail mills are sold considerably ahead. The sheet and bar mills are rather slack just now, and old material of all kinds is very dull. The pipe mills are all running to their full capacity. The use made of natural gas has been a godsend for the iron trade, particularly in Pittsburg and vicinity. Hundreds of miles of pipe are laying, conveying the gas in all directions, for home use as well as for manufacturing purposes.

Pig-Iron.—We have to note a dull market, with sellers doing the visiting, and a good deal of it, which describes the situation. What the rest of the week will do, remains to be seen. The sales to this time have been extremely light, with a weakening tendency in values, without any actual decline. It must, however, be admitted that prices have held up, all things taken into consideration, remarkably well. At this time, without any material increase in supply, the indications of a surplus are equally clear, and to this fact is due the prevailing feeling of weakness and depression.

Muck-Bar.—The demand continues light. An improvement is looked for in the near future. Nominal rates $27.50, cash; $28 4 months.

Old Rails.—Dull. The last sale made at $20, cash; buyers indifferent.

Ore.—We report sales of several thousand tons Lake Superior Bessemer ore at $5 a ton.

Pig-Iron.—The following are the current rates:

Coke or bituminous:	$	$
Foundry No. 1	17.50@	18.00
Foundry No. 2	16.75@	17 25
Gray F., No. 3	15.50@	16.00
" " No. 4	15.00@	15.25
White	14.50@	15.00
Mottled	15.00@	15.50
Silvery	15.50@	18.50
Bessemer	19.00@	19 50
Charcoal:		
Foundry No. 1	21.50@	23.00
Foundry No. 2	20.00@	20.50
Cold-Blast	25.00@	28.00
Warm-Blast	18.00@	24.00

	$	$
20 p. c. Spiegel	28 50@	29 00
Muck-Bar	27.50@	28.00
Steel Blooms	31.00@	36.00
Steel Slabs	29.00@	33 00
Steel Crop Ends	23.00@	.....
Steel Bloom Ends	22.00@	22.50
Old Iron Rails	20.00@	.....
Old Steel Rails	21.00@	21.50
No. 1 W. Scrap	18.00@	18.50
No. 2 W. Scrap	15.50@	16.00
Steel Rails	36.00@	.....
" light sect's	35.00@	42.00
Bar Iron	1.70@	1.75
Iron Nails, 60 days	2.15@	2.20

PITTSBURG SALES.

400 tons	No. 1 Mill, Lake ore	$16.50	cash
100 "	Foundry No. 2	18.00	4 mos.
300 "	Gray Forge, Native ore	16.00	cash.
500 "	Anthracite Gray Forge	16 00	"
150 "	Hot-Blast Charcoal	19.75	"

Louisville. May 19.

[Reported by GEORGE H. HULL & Co.]

The market for pig-iron is in an unsatisfactory condition, and it is difficult to give accurate quotations. The labor trouble still shows a marked influence upon the market, but the prevailing opinion is, that this will shortly disappear and that prices will advance. Most

producers, therefore, are reasonably firm on figures, and not disposed to press sales.

We quote for cash in round lots as below :

Southern Coke No. 1, Foundry	$17.00@$17.50
" " No. 2, "	16.00@ 16.50
" " No. 2½, "	15.50@ 16.00
Hanging Rock Coke, No. 1, Foundry	16.50@ 17.00
" " Charcoal, No. 1 Foundry	19.00@ 20.00
Southern Charcoal, No. 1 Foundry	17.50@ 18.50
Silver Gray, different grades	15.00@ 16.00
Southern Coke, No. 1 Mill, Neutral	15.00@ 15.50
" " No. 2 " "	14.00@ 14.50
" " No. 1 " Cold Short	14.50@ 15.00
" Charcoal, No. 1 Mill	17 00@ 17.50
White and Mottled, different grades	13.00@ 14.00
Southern Car Wheel, Standard Brands	25.00@ 26.00
" " " Other "	21.00@ 22.00
Hanging Rock, Cold Blast	25.00@ 26 00
" " Warm Blast	20.00@ 21.00

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 21.

Statistics.

Production Anthracite Coal for week ended May 15th, and year from January 1st :

TONS OF 2240 LBS.	1886. Week.	1886. Year.	1885. Week.	1885. Year.
P. & Read. RR. Co.	232,431	3,646,248	225,397	3,325,347
L. V. RR. Co.	137,667	2,155,495	140,237	1,686,893
D. L. & W. RR. Co.	84,009	1,885,526	75,572	1,344,860
D., & H. Canal Co.	60,335	1,321,201	66,432	937,644
Penna. RR.	46,528	1,174,041	54,437	1,090,754
Penna. Coal Co.	29,643	425,233	25,385	409,298
Total	590,613	10,607,744	587,460	8,794,796
Increase	3,153	1,812,948		
Decrease				

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period :

1881	9,332,027	1883	10,412,742
1882	9,178,604	1884	10,009,642

The Norfolk & Western Railroad Company reports the shipments of Pocahontas Flat-Top coal for the week ended May 15th, 1886, and year from January 1st as follows, tons of 2000 pounds : 1886—Week, 21,602 ; year, 297,366. 1885—Week, 13,469 ; year, 195,046. Increase, 1886—Week, 8,133 ; increase, year, 102,320.

Production Bituminous Coal for week ended May 15th, and year from January 1st :

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1886. Week.	1886. Year.	1885. Week.	1885. Year.
Phila. & Erie RR.	17	7,440		11,307
*Cumberland, Md.	737	375,698	65,855	938,036
*Barclay, Pa.	4,044	76,535	3,477	95,841
*Broad Top, Pa.				
H. & Broad Top RR.	9,626	140,856	3,832	66,209
East Broad Top				
Clearfield Region, Pa.				
Snow Shoe		34,770	2,840	69.638
Karthaus (Keating)	2,402	48,253	1,389	52,211
Tyrone & Clearfield	17,252	624,506	53,472	1,167,347
Alleghany Region, Pa.				
Gallitzin & Mountain	25,350	310,240	10,852	190,687
Total	59,428	1,618,298	141,717	2,591,276

* Tons of 2240 lbs.

WESTERN SHIPMENTS.‡

Pittsburg Region, Pa.				
West Penn RR.	4,909	109,686	6,085	106,916
SouthwestPenn. RR.	4,413	75,836	2,298	41.620
Pennsylvania RR.	5,412	77,917	6,168	68,518
Westmoreland Region, Pa.				
Pennsylvania RR.	6,756	358,392	34,300	325,873
Monongahela Region, Pa.				
Pennsylvania RR.	5,408	112,043	4,818	73,868
Total	26,898	733,874	53,669	616,795
Grand total	86,326	2,352,172	195,386	3,208,071

Production of Coke on line of Pennsylvania RR. for week ended May 15th, and year from January 1st :

Tons of 2000 pounds.

	1886. Week.	1886. Year.	1885. Week.	1885. Year.
Alleghany Region.	4,164	77,690	3,589	70,000
West Penn. RR.	1,550	35,793	1,218	13,656
Southwest Penn. RR	50,520	815,904	31,373	715,882
Penn. & W. Region	5,924	119,807	4,079	86,652
Monongahela	1,076	41,430	2,236	32,587
Pittsburg Region.				
Snow Shoe		9,211		5,923
Total	63,234	1,099,835	43,092	924,700

Anthracite.

Since our last, trade has been very quiet, with all indications that this condition will continue at least for weeks to come. The strikes have had a very depressing influence upon general business, which is strongly reflected in the present demand for coal. A more important cause of the existing depression in the coal trade, however, may be found in an examination of the official table of coal production for the first four months of this year and last. It will be seen that there is an increase of 1,905,893 tons this year. This is an unreasonable increase for so short a period, and naturally represents an undue anticipation of wants, caused by the very low prices that prevailed earlier in the year. It is stated that very many yards are full of coal, and especially is this the case in this city. Although there will probably be but little new business done before the middle of July, still we do not look for a great accumulation of stocks at the shipping ports. There are a great many orders on the books of the companies, taken at low prices, which will permit the movement of coal to continue, and at the same time the companies will take this opportunity to stock their depots in the East and the West. While a large number of dealers are very liberally supplied with coal, there are many who are not, and who would be putting in stock now did they not think that prices are going lower. This class will, as a rule, hold off for the last cent of the decline, when they will all rush upon the market and the usual rapid autumn advance in prices will occur. We look for some decline, but advise against postponing the placing of large orders to the last moment.

The Boston retail dealers have withdrawn from the papers their advertisements announcing reduced prices. Upon the surface, this matter is settled, but still there is considerable uneasiness, through fear that the war may break out afresh. The temper of the companies is such that, if any trickery were to become exposed, the battle would be resumed very quickly and with much warmth.

The inroads of the Delaware, Lackawanna & Western and some other companies upon the Northern trade, which the Delaware & Hudson and the Pennsylvania coal companies look upon as belonging to them, is a matter of more or less discussion. It is figured out that some broken and egg coal sent to that market by the Delaware, Lackawanna & Western Company does not net it above $2.85 a ton, f. o. b. Hoboken.

The allotment for June was fixed yesterday at 2,400,000 tons. The official statistics show that some of the companies had overproduced their allotments, to the beginning of this month, about 150,000 tons. It is agreed that the quotas shall be equalized by July 1st. This will practically make the output for June but 2,250,000 tons, which is very conservative. In fact, the workings of the combination are very satisfactory, and those concerns that are strong enough to patiently await results are likely to receive liberal reward for doing so.

One of the most encouraging features of the trade at present is the large consumption of coal by the anthracite iron furnaces. On the first of the month, there were 119 furnaces blowing, which were estimated to produce about 38,000 tons of iron weekly. This great increase in the demand for furnace coal under a limited production will prevent domestic sizes from accumulating in any thing like the quantities that they have for several years past at this season of the year, from the fact that not nearly as great a proportion of them will be produced. If it were not for the demand from furnaces and the line trade, it is probable that the production for next month would have been made even smaller.

It is asserted that at least one, and probably two, of the companies are selling coal at less than circular prices, through contractors or favored agents. There is also a complaint that one, if not more, is practically doing its entire business at net prices, whereas these are intended for the wholesale trade only. Of course, this rule has not been observed by any of them when desirable trade was in question.

The average price received by the Delaware, Lackawanna & Western Railroad Company for all coal sold by it f. o. b. vessel at Hoboken during April was about $2.86 per ton, an increase of 13 cents a ton over March.

Mr. John H. Jones, official accountant, furnishes the following statement of the anthracite coal tonnage for the month of April, 1886, compared with the same period last year. This statement includes the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines :

COMPANIES.	April, 1886.	April, 1885.	Difference.
Phila. & Reading RR.	780,226	905,550	D. 125,324
Lehigh Valley RR.	436,332	438,291	D. 1,959
Del., Lack. & West. RR.	317,332	295,227	I. 22.105
Del. & Hud. Canal Co.	211,122	268,338	D. 57,216
Pennsylvania RR.	294,578	273,559	I. 21,019
Pennsylvania Coal Co.	95,136	109,567	D. 14,429
N. Y., L. E. & W. RR.	60,000	45,691	I. 14,309
Total	2,194,726	2,336,223	D. 141,497

COMPANIES.	For Year 1886.	For Year 1885.	Difference.
Phila. & Reading RR.	3,165,954	2,851,060	I. 314,894
Lehigh Valley RR.	1,887,906	1,420.056	I. 467,850
Del., Lack. & West. RR	1,717,275	1,209,519	I. 507,756
Del. & Hud. Canal Co.	1,199,761	791,791	I. 407,970
Pennsylvania RR	1,076,374	979,845	I. 96,529
Pennsylvania Coal Co.	370,211	358,259	I. 11.952
N. Y., L. E. & W RR.	259,937	160,994	I. 98,943
Total	9,677,418	7,771,524	I. 1,905,894

The stock of coal on band at tide-water shipping points, April 30th, 1886, was 704,169 tons ; on March 31st, 1886, 942,470 tons ; decrease, 238,301 tons.

The decrease in stocks was very encouraging. Some of the companies have probably been accumulating some coal this month, but the Reading Company has been steadily decreasing its stock. On last Saturday, this company had on hand at Port Richmond but 64,658 tons.

We quote ordinary free-burning coals f. o. b. as follows :

	Week ended May 21.	May 14.	May 7.
Lump	$3.00@	$3.00@$3.15	$3.00@$3.15
Steamboat	3.00@	3.00@ 3.15	3.00@ 3.15
Broken	2.90@ 3.00	3.00@	3.00@ ....
Egg	2.90@ 3.00	2.90@ 3.00	2 90@ 3.00
Stove	3 10@ 3.40	3.25@ 3.40	3.25@ 3.40
Chestnut	2.80@ 3.00	2.85@ 3.00	2.85@ 3.00
Pea	1.85@ 2.10	1.85@ 2.15	2.00@ 2.15
Buckwheat	1.55@ 1.75	1.55@ 1.75	1.75@ 1.85
Dust	1.25@ 1.35	1.25@ 1.35	1.25@ ....

The steam sizes are not in as active demand as they were, while stove and chestnut sizes are very heavy.

The Secretary of the Navy has decided to secure all the coal required for the use of the navy during the next fiscal year on one contract, instead of obtaining coal under a large number of contracts, as has heretofore been the custom.

Bituminous.

As we predicted last week would be the case, the Cumberland miners have gone to work at the old rate of wages. On Saturday, the delegates from the several mines met the presidents of the companies at Cumberland. The meeting lasted about three hours, and was of a very satisfactory character. The miners recognized that they had permitted unwise counsels to prevail with them in inaugurating the strike, and it is probable that a better understanding now exists between the companies and their employés than has existed for a long time past. Federation No. 3 never had a large membership, and it is probable that it will have a much smaller one now that it has been so badly defeated. An organization covering so much territory as that which this one attempted must of necessity prove a failure. Owing to the differences in size of vein, ease of mining, and other local conditions, what may be a grievance in one district may not be so in another. In fact, the question of a price to be paid for mining is purely a local one, and should be so considered. The Cumberland miners, at least, have come to the conclusion that their employers are not their natural enemies, and they know that if there is prosperity in the coal trade they are likely to secure their fair share of it. The recent strike and its failure also demonstrate that they can not force prosperity for themselves when the companies are not making money.

The indications are, that the Clearfield miners will soon resume work. In fact, it will be very foolish in them if they do not, as the resumption of the Cumberland miners at the old wages will relieve the market of all possible embarrassment, and make it impossible for the Clearfield companies to pay the advance and meet the competition of those who are paying a lower rate of wages. Every day that the miners remain out not only represents a day's wages lost, but permits competing districts to secure contracts for delivering coal, which will greatly reduce the powers of the com-

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.			
1	Adams, s. L	Colo.	$1,500,000	150,000	$10	*	.. ..	.....	.....	$382,500	May	1886	.15	
2	Alice, S. C	Mont	10,000,000	400,000	25	*	.....	.....	.....	700,000	Mar.	1886	.06¼	
3	Amie Con., S. L	Colo.	5,000,000	500,000	10	*	.....	.....	.....	330,000	Oct.	1883	.05	
4	Atlantic, C	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	320,000	Jan.	1886	$1.00	
5	Argenta, S	Nev.	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	1880	.20	
6	Barbee & Walker, S.	Utah	1,000,000	100,000	10	*	.....	.....	.....	60,000	Nov	1880	.10	
7	Bassick, G. S	Colo.	10,000,000	100,000	10	*	.....	.....	.....	400,000	Mar.	1884	1.00	
8	Belle Isle, S.	Nev.	10,000,000	100,000	100	140,000	May	1886	.10	300,000	Dec.	1879	.25	
9	Belcher, G. S	Nev.	10,400,000	104,000	100	2,217,335	ec.	1885	.30	15,397,000	Apl.	1876	1.00	
10	Bellevue Idaho, S. L	Idah.	1,250,000	125,000	10	26,250	Dec.	1883	10	87,500	Dec.	1845	.10	
11	Big B'nd Hydraulic, G	Dak.	1,000,000	200,000	5	*	.....	.....	.....	162,000	Apl	1886	.03	
12	Black Bear, G	Cal.	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1843	.20	
13	Bodie Con., G. S	Cal.	10,000,000	100,000	100	274,990	Dec.	1883	.50	1,602,572	Apl.	1885	.50	
14	Bonanza Developm't	C & M	3,000,000	300,000	10	.....	.....	.....	.....	135,000	Oct.	1882	.15	
15	Bonanza K'g, Cons. S.	Cal.	1,000,000	100,000	10	*	.. ..	.....	.....	185,000	Feb.	1885	.10	
16	Boston & Mont. G	Mont	2,000,000	200,000	10	*	.....	.....	.....	490,000	May	1886	.15	
17	Breece, S	Colo.	5,000,000	200,000	25	*	.....	.....	.....	2,000	Feb.	1880	.01	
18	Buiw-r, G	Cal	1,000,000	100,000	100	40,000	Oct.	1885	20	175,000	Jan.	1884	.10	
19	Caledonia, G	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10	
20	Calumet & Hecla, C	Mich	2,500,000	100,000	25	.. ..	..	.....	.....	27,350,000	Jan.	1886	5.00	
21	Carbonate Hill, S. L	Colo.	2,000,000	200,000	10	*	..	.....	.....	80,000	Apl.	1884	.05	
22	Carbon Con., S	Colo.	1,530,000	153,000	10	*	.....	.....	.....	50,000	Mch	1880	.10	
23	Castle Creek, G	Idah.	100,000	100,000	1	.....	.....	.....	.....	51,000	Oct.	1883	.03	
24	Catalpa, S. L	Colo.	3,000,000	300,000	10	*	.....	.....	.....	270,000	May.	1884	.10	
25	Central, C	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,780,000	Jan.	1886	2.00	
26	Christy, S	Utah	10,000,000	100,000	100	.....	.....	.....	.....	10,000	Jun.	1885	.10	
27	Chrysolite, S. L	Colo.	10,000,000	200,000	50	*	.....	.....	.....	1,650,000	Dec.	1884	.25	
28	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*	.....	.....	.....	102,500	Jun	1886	.05	
29	Cons Cal. & Va., G. S.	Nev.,	21,600,000	216,000	100	108,000	Jan.	1885	.20	64,800	Feb.	1886	.30	
30	Con. Gold Mining, G	Ga...	500,000	100,000	5	*	.....	.....	.....	108,000	Nov.	1883	.02	
31	Contention, S	Ariz.	12,500,000	250,000	50	.....	.....	.....	.....	2,587,000	Dec.	1884	.25	
32	Crescent, S. L. G	Utah	15,000,000	300,000	25	±	.....	.....	.....	180,000	Sept	1885	.05	
33	Crown Point, G. S	Nev.,	10,000,000	100,000	100	2,675,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00	
34	Deadwood-Terra, G	Dak.	5,000,000	200,000	25	*	.....	.....	.....	900,000	Jan.	1883	.10	
35	Derbec B. Grav., G. S.	Cal.	10,000,000	10,000,000	100	90,000	Dec.	1881	.10	130,000	Apl.	1886	.10	
36	Dunkin, S. L	Colo.	5,000,000	200,000	25	*	.....	.....	.....	220,000	Sept	1884	.05	
37	Elkhorn, G. S	Mont	1,000,000	100,000	10	50,000	July	1883	.50	115,000	Apl.	1886	.50	
38	Eureka Con., G. S. L	Nev.,	5,000,000	50,000	100	450,000	Apl	1886	1.00	4,817,500	July	1882	.25	
39	Evening Star, S. L	Colo.	500,000	30,000	10	.....	.....	.....	.....	1,400,000	Nov	1883	.50	
40	Excelsior G	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1881	.25	
41	Father de Smet, G	Dak..	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20	
42	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun	1871	.....	480,000	Dec.	1885	1.00	
43	Freeland, G. S. C	Colo.	5,000,000	200,000	25	*	.....	.....	.....	170,000	Apl	1886	.10	
44	Fresno Enterprise, G	Cal..	5,000,000	100,000	50	.....	Mch	1883	.10	110,000	July	1882	.10	
45	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	3,917,000	Mar.	1886	.40	3,826,000	Oct.	1879	10.00	
46	Grand Central, S	Ariz.	1,000,000	100,000	10	.....	.....	.....	.....	625,000	Dec.	1882	.25	
47	Grand Prize, S	Nev..	10,000,000	100,000	100	573, 0	Apl.	1886	.40	495,000	Mar.	1884	.25	
48	Granite, S	Colo.	125,000	125,000	1	.....	.....	.....	.....	6,250	May	1883	.01	
49	Granite Mountain, S.	Mont	10,000,000	400,000	25	.....	.....	.....	.....	1,000,000	May	1886	.25	
50	Green Mountain, G	Cal..	1,250,000	125,000	10	*	.....	.....	.....	212,000	Nov.	1881	.07½	
51	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	4,874,000	May.	1886	.50	1,598,000	Apl	1871	5.00	
52	Hall-Anderson, G	N. S..	150,000	150,000	1	.....	.....	.....	.....	7,000	Jan.	1882	.05	
53	Hecla Con., S. G. L. C	Mont	1,500,000	30,000	50	.. ..	..	.....	.....	1,002,000	May	1886	.50	
54	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	.....	.....	.....	.....	158,250	Jan	1886	.03	
55	Holmes, S	Nev.	10,000,000	100,000	100	300,000	Sept	1885	.10	75,000	Apl.	1886	.25	
56	Holyoke, G	Utah.	200,000	200,000	1	.....	.....	.....	.....	27,000	Feb.	1883	.10	
57	Homestake, G	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	3,338,750	May	1886	.40	
58	Honorine, S. L	Utah	5 0,000	250,000	2	25,000	Jun.	1883	....	69,500	Nov	1885	.05	
59	Hope, S	Mont	400,000	8,000	50	*	.....	.....	.....	158,252	Apl.	1884	1.50	
60	Horn-Silver, S. L	Utah	10,000,000	400,000	25	*	.....	.....	.....	4,000,000	Nov.	1884	.50	
61	Idaho, G	Cal..	310,000	3,100	100	.....	.....	.....	.....	3,892,800	Dec.	1885	7.50	
62	Independence, S	Nev..	10,000,000	100,000	100	320,000	Aug.	1885	.20	225,000	Sept	1879	.25	
63	Indian Queen, S	Nev..	250,000	125,000	2	.....	.....	.....	.....	368,750	July	1883	.03	
64	Inyo, G	Cal..	500,000	100,000	5	*	.....	.....	.....	45,000	Apl.	1882	.05	
65	Iron Hill, S	Dak.	2,500,000	25,000	20	82,500	Oct.	1885	....	62,500	May	1886	.10	
66	Iron-Silver, S. L	Colo	10,000,000	500,000	20	*	.....	.....	.....	1,600,000	Apl.	1886	.20	
67	Jackson, G. S	Nev.	5,000,000	50,000	100	10,000	Nov.	1880	.20	35,000	Mar.	1884	.10	
68	Jocuistita, S	Mex.	2,500,000	250,000	10	.....	.....	.....	.....	1,200,000	Feb.	1886	.50	
69	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov	1881	.30	1,350,000	July	1884	.10	
70	La Plata, S. L	Colo.	2,000,000	200,000	10	*	.. ..	.....	.....	610,000	Sept	1882	.30	
71	Leadville Cons., S. L	Colo	4,000,000	400,000	10	*	.....	.....	.....	390,000	May.	1886	.05	
72	Lexington, G. S	Mont	4,000,000	40,000	100	*	.....	.....	.....	565,000	Jan	1885	2.00	
73	Little Chief, S. L	Colo	10,000,000	200,000	50	*	.....	.....	.....	780,000	Mch	1885	.10	
74	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*	.....	.....	.....	1,050,000	Mch	1880	.50	
75	Manhattan, S	Nev.	5,000,000	50,000	100	150,000	July	1879	1.00	437,500	Feb	1886	.25	
76	Marguerite, G	Cal..	500,000	25,000	20	.....	.....	.....	.....	18,750	Oct.	1882	.25	
77	Martin White, S	Nev.	10,000,000	100,000	100	1,150,000	Mar.	1886	.25	90,000	July	1879	.30	
78	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl.	1883	1.00	1,826,000	Mar.	1876	.....	
79	Mono, G	Colo.	5,000,000	5,000	100	56,000	Jun	1845	.50	12,500	Mar.	1886	.25	
80	Montana, Lt. G. S	Mont	3,300,000	33,000	10	*	.....	.....	.....	301,950	Jan.	1886	.37½	
81	Morning Star, S. L	Colo.	1,000,000	100,000	10	.....	.....	.....	.....	550,000	Sept	1885	.25	
82	Moulton, S. G	Mont	2,000,000	400,000	5	*	.....	.....	.....	233,000	Mar	1886	.07½	
83	Mount Pleasant, G	Cal.	150,000	150,000	1	*	.....	.....	.....	105,000	Mar.	1881	.10	
84	Mt. Diablo, S	Nev	5,000,000	50,000	100	137,500	Jun.	1885	2.00	80,000	July	1885	.20	
85	Napa, Q	Cal..	700,000	100,000	7	.....	.....	.....	.....	290,000	Jan.	1881	.10	
86	Navajo, G. S	Nev..	10,000,000	100,000	100	395,000	Mar.	1886	25	325,000	Feb.	1885	.25	
87	N Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*	.....	.....	.....	30,000	Dec.	1885	.06½	
88	New York Hill, G	Cal..	5,000,000	50,000	100	62,500	Oct	1885	.15	215,000	Aug.	1882	.10	
89	Northern Belle, S	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.30	2,400,000	Apl.	1883	.50	
90	North Bell Isle, S	Nev..	10,000,000	100,000	100	150,000	Mar	1886	.20	31,000	Aug.	1881	.15	
91	Ontario, S. L	Utah	15,000,000	150,000	100	.....	.....	.....	.....	7,400,000	May.	1886	.50	
92	Ophir, G. S	Nev..	10,000,000	100,000	100	3,932,800	Feb.	1886	30	1,595,000	July	1882	1.00	
93	Original, S. C	Mont	1,500,000	60,000	25	*	.....	.....	.....	114,000	Oct.	1881	.05	
94	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	972,500	Sept	1884	.25	
95	Oxford, G	N. S.	125,000	125,000	1	*	.....	.....	.....	34,500	Oct.	1885	.02	
96	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar.	1882	.15	6,000	Feb.	1880	.10	
97	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	40,000	Mar.	1884	.10	30,000	Dec.	1882	.05	
98	Piutus, G. S C. L	Colo.	2,000,000	200,000	10	*	.....	.....	.....	20,000	Feb.	1886	.10	
99	Plymouth Con., G	Cal.	5,000,000	100,000	50	*	.....	.....	.....	1,675,000	May	1883	.25	
100	Prussian, S. L	Colo	1,500,000	150,000	.....	.....	.....	.....	.....	132,000	Jan	1883	.10	
101	Quicksilver, pref., Q	Cal..	4,300,000	43,000	100	.....	.....	.....	.....	731,400	Feb.	1886	1.50	
102	" com., Q	Cal..	5,700,000	57,000	100	.....	.....	.....	.....	151,000	July	1882	.40	
103	Quincy, C	Mich	1,000,000	40,000	25	200,000	Dec.	1862	.....	4,330,000	Jan.	1886	4.00	
104	Richmond, S. L	Nev..	1,350,000	54,000	25	*	.....	.....	.....	4,177,587	May	1886	1.25	
105	Ridge, C	Mich.	500,000	20,000	25	220,000	Mar.	1886	.50	10,000	Feb.	1880	.50	
106	Rising Sun, S	Dak..	750,000	150,000	5	*	.....	.....	.....	52,000	May	1881	.07½	
107	Robinson Con., S. L	Colo.	10,000,000	200,000	50	*	.....	.....	.....	585,000	Mar.	1886	.05	
108	Robert E. Lee, S. L	Colo.	10,000,000	500,000	20	.. ..	.....	.....	.....	100,000	Dec.	1882	.10	
109	Rooks, G	Vt...	500,000	50,000	10	*	.....	.....	.....	61,000	Apr	1885	.30	
110	San Francisco, C	Cal..	5,000,000	50,000	100	45,000	Sept	1880	.50	20,000	Feb.	1883	.05	
111	Savage, S	Nev..	11,200,000	112,000	100	6,100,000	Jan.	1886	.50	4,460,000	July	1859	3.00	
112	Security L. Mg, Mfg	Colo.	1,000,000	100,000	10	*	.....	.....	.....	50,000	July	1884	.....	
113	Snoshone, G	Idah.	150,000	150,000	1	.....	.....	.....	.....	7,500	Apl.	1883	.01	
114	Sierra Buttes, G	Cal..	225,000	22,500	10	.....	.....	.....	.....	1,430,639	Apl.	1886	.25	
115	Sierra Grande, S	N. M.	2,500,000	500,000	5	*	.....	.....	.....	860,000	Sept	1884	.25	
116	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	5,922,698	Jan.	1886	.25	104,000	Jan.	1871	1.00	
117	Silver Cord, G. S. L	Colo.	5,000,000	500,000	10	.....	.....	.....	.....	225,000	Nov.	1883	.25	
118	Silver King, S	Ariz.	10,000,000	100,000	100	.....	.....	.....	.....	1,675,000	May.	1884	25	
119	Silverton, G. S. L	Colo.	2,000,000	200,000	10	*	.....	.. ..	.....	52,000	May.	1886	.02	
120	Small Hopes, Cons., S.	Colo.	5,000,000	250,000	20	*	.....	.....	.....	2,050,000	May.	1883	.25	
121	Smuggler, S. L	Colo.	600,000	60,000	10	.....	.....	.....	.....	66,700	Aug.	1883	.25¾	
122	Socorro, G	N. M.	250,000	2,500	100	.....	.....	.....	.....	4,000	Mch	1882	.00	
123	South Yuba, G	Cal..	2,000,000	40,000	50	*	.....	.....	.....	150,000	Oct.	1881	.75	
124	Spring Valley, G	Cal..	200,000	200,000	1	*	.....	.....	.....	50,000	Jan.	1881	.25	
125	Standard, G. S	Cal..	10,000,000	100,000	100	25,000	Oct.	1884	.25	4,425,000	Mar.	1884	.25	
126	Stormont, S	Utah	500,000	500,000	1	*	.....	.....	.....	155,000	Nov.	1881	.05	
127	St. Joseph, L	Mo..	1,100,000	110,000	10	*	.....	.....	.....	495,000	Dec.	1885	.20	
128	Syndicate, G	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10	
129	Tip Top, S	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20	
130	Tombstone, G. S. L	Ariz	12,500,000	500,000	25	*	.....	.....	.....	1,250,000	Apl.	1882	.10	
131	True Fissure, G. S. L	Utah	1,500,000	150,000	10	*	.....	.....	.....	75,000	Jun.	1883	.15	
132	United Verde, C	Ariz.	3,000,000	300,000	10	*	.....	.....	.....	97,500	Feb.	1884	.20	
133	Valencia, M	N. H.	150,000	1,500	100	*	.....	.....	.....	41,250	Apl	1886	2.50	
134	Vizina, S	Ariz.	5,000,000	200,000	25	*	.....	.....	.....	140,000	Apl.	1882	.10	
135	Yellow Jacket, G. S.	Nev.	12,000,000	12,000	100	5,448,000	Dec.	1885	.75	2,184,000	Aug.	1871	1.50	

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last			
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*	.....	.....	.....	
2	Albion, S. L	Nev..	15,000,000	150,000	100	$577,000	July	1883	.50	
3	Allouez, C	Mich	2,000,000	80,000	25	240,000	Feb.	1884	.50	
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	430,000	Mar	1886	.50	
5	Alta, S	Nev..	10,080,000	100,800	100	1,954,400	Feb.	1886	.25	
6	American Flag, S	Colo.	1,250,000	125,000	10	300,000	Jun.	1877	.25	
7	Aspen Mg. & S, S. L	Colo.	2,000,000	200,000	10	.....	.....	.....	.....	
8	Barcelona, G	Nev..	5,000,000	200,000	25	*	.....	.....	.....	
9	Battle Creek, G	Dak.	5,000,000	200,000	25	.....	.....	.....	.....	
10	Bear Creek	Cal..	300,000	300,000	1	.....	.....	.....	.....	
11	Bechtel Con., G	Cal..	10,000,000	100,000	100	173,500	n.	1883	.10	
12	Belvidere	Cal..	.....	60,000	.....	92,000	b.	1882	.15	
13	Belmont, S	Nev..	5,000,000	50,000	100	735,000	Apl.	18 6	.10	
14	Best & Belcher, G. S	Nev.	10,080,000	100,800	100	1,647,790	Jan.	1886	.50	
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*	.....	.....	.....	
16	Black Jack, G	Cal..	250,000	100,000	2½	.....	.....	.....	.....	
17	Bonanza Chief	Mon	1,000,000	1,000,000	1	*	.....	.....	.....	
18	Bondholder	Colo	500,000	200,000	2½	.....	.....	.....	.....	
19	Boston Con., G	Cal..	13,000,000	100,000	100	170,000	Nov	1883	.25	
20	Bradshaw, S	Ariz.	2,250,000	225,000	10	.....	.....	.....	.....	
21	Buckeye	Colo.	2,000,000	400,000	5	*	.....	.....	.....	
22	" preferred	Colo.	.....	.....	.....	*	.....	.....	.....	
23	Bull Domingo, S. L	Colo.	10,000,000	200,000	50	*	.....	.....	.....	
24	Bullion, G. S	Nev..	10,000,000	100,000	100	4,570,000	July	1885	.25	
25	Bye and Bye	Ariz.	1,000,000	100,000	10	*	.....	.....	.....	
26	Calaveras, G	Cal..	500,000	500,000	1	*	.....	.....	.....	
27	Cal. W'r & M. Co., G	Cal..	.....	.....	.....	.....	.....	.....	.....	
28	Castle Creek, G	Idah.	.....	.....	.....	.....	.....	.....	.....	
29	Catskill, S	Nev..	1,500,000	300,000	5	.....	.....	.....	.....	
30	Central Arizona, S.	Ariz.	10,000,000	100,000	100	.....	.....	.....	.....	
31	Cherokee, G	Cal..	1,500,000	15,000	10	.....	.....	.....	.....	
32	Chollar, S	Nev..	11,200,000	112,000	100	928,000	Dec.	1885	.50	
33	Climax, S. L	Colo.	2,000,000	200,000	10	*	.....	.....	.....	
34	Colorado No. 2, S. L	Colo.	100,000	10,000	10	.....	.....	.....	.....	
35	Con. Imperial, G. S.	Nev.,	50,000,000	500,000	100	1,050,000	May	1885	10	
36	Con. Pacific, G	Cal..	6,000,000	60,000	100	174,000	Feb.	1886	.15	
37	**Con. Queen Cons, C.	Ariz.	1,400 00	140,000	10	.....	.....	.....	.....	
38	Crescent, S. L	Colo.	3,000,000	300,000	10	*	.....	.....	.....	
39	Crocker, S	Ariz.	10,000,000	100,000	100	45,000	Mar	1886	.20	
40	Crowell, G	N. C.	500,000	500,000	1	.....	.....	.....	.....	
41	Dahlonega, G	Ga...	250,000	250,000	1	*	.....	.....	.....	
42	Dardanelles, G	Cal..	1,000,000	100,000	10	*	.....	.....	.....	
43	Decatur, S	Colo.	1,500,000	300,000	5	*	.....	.....	.....	
44	Denver City, S. L	Colo.	5,000,000	500,000	10	*	.....	.....	.....	
45	Denver Gold, S. L	Colo.	300,000	60,000	5	.....	.....	.....	.....	
46	Deseret, G. S	Utah	500,000	50,000	10	*	.....	.....	.....	
47	Dunderberg, S	Colo	1,500,000	150,000	10	*	.....	.....	.....	
48	Durango, G	Colo	500,000	500,000	1	*	.....	.....	.....	
49	Eastern Dev. Co., Lt	N. S.	1,500,000	150,000	10	840,000	May	1885	.10	
50	Elko Con., S	Nev..	.....	.....	.....	.....	Mar	1884	.15	
51	Empire Lt, G	Mon.	500,000	100,000	5	.....	.....	.....	.....	
52	Empire, S	Utah	10,000,000	100,000	100	*	.....	.....	.....	
53	Enterprise, S. L	Colo.	800,000	80,000	10	*	.....	.....	.....	
54	Eureka Tunnel, S. L	Nev..	10,000,000	100,000	100	*	.....	.....	.....	
55	Exchequer	Nev..	10,000,000	100,000	100	840,000	Aug	1885	.20	
56	Garfield, Lt., G. S	Nev.	500,000	100,000	5	.....	.....	.....	.....	
57	Globe Copper	Ariz	.....	.....	.....	.....	.....	.....	.....	
58	Gold Placer, G	Colo.	5,000,000	200,000	25	*	.....	.....	.....	
59	Goodshaw, G	Cal..	1,000,000	100,000	100	229,314	Dec.	1885	.25	
60	Grand Belt, C	Te c.	12,000,000	120,000	100	*	.....	.....	.....	
61	Granville, G	N. C.	300,000	300,000	1	*	.....	.....	.....	
62	Gregory-Bobtail, G	Colo.	550,000	550,000	1	.....	.....	.....	.....	
63	Harlem M. & M. Co, G.	Cal..	1,000,000	200,000	5	.....	.....	.....	.....	
64	Head Cent. & Tr. S. G	Ariz.	10,000,000	100,000	100	.....	.....	.....	.....	
65	Hidalgo, S	Mex.	200,000	20,000	10	.....	.....	.....	.....	
66	Highland, C	Mich	500,000	25,000	25	.....	.....	.....	.....	
67	Hortense, S	Colo.	2,000,000	200,000	10	.....	.....	.....	.....	
68	Iroquois, C	Mich	1,250,000	50,000	25	.....	.....	.....	.....	
69	J. D. Reymert	Ariz	10,000,000	100,000	100	*	.....	.....	.....	
70	Julia Cons, G. S	Nev..	11,000,000	110,000	100	1,438,000	Nov	1885	.10	
71	Kearsarge, C	Mich	1,250,000	50,000	25	100,000	Apl.	1886	5.00	
72	Lacrosse, G	Colo.	1,000,000	100,000	10	*	.....	.....	.....	
73	Lee Basin, S	Colo.	5,000,000	500,000	10	*	Sept	1882	.25	
74	Leviathan, S	Nev..	10,000,000	100,000	100	380,000	.....	.....	.....	
75	Lucerne, S	Colo	5,000,000	500,000	10	*	Jan.	1885	.10	
76	Mammoth Bar., G	Cal..	10,000,000	100,000	100	50,000	Dec.	1881	.....	
77	Mariposa pref., G	Cal..	5,000,000	50,000	100	1,687,500	Feb.	1883	.25	
78	" common, G	Cal..	10,000,000	100,000	100	1,975,000	Dec.	1881	.20	
79	May Belle, G	Cal..	10,000,000	100,000	100	84,000	Mar	1884	.15	
80	Mayflower, S	Nev..	1,000,000	100,000	100	60,000	Feb.	1886	.25	
81	Mexican, G. S	Nev.	10,000,000	100,800	100	2,540,500	.....	.....	.....	
82	Michoacan Synd	Mex.	.....	.....	.....	.....	.....	.....	.....	
83	Mine & Starr, S. L	Colo.	1,000,000	200,000	5	*	.....	.....	.....	
84	Miner Boy, G. S. L	Colo.	5,000,000	500,000	10	*	.....	.....	.....	
85	Miller	Nev	5,000,000	200,000	25	.....	.....	.....	.....	
86	Moose Silver, S	Colo.	3,000,000	300,000	10	*	.....	.....	.....	
87	New Pittsburg, S. L	Colo	2,000,000	200,000	10	*	.....	.....	.....	
88	North Standard, G	Cal..	10,000,000	100,000	100	20,000	Nov	.....	.....	
89	Noonday	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10	
90	Old Dominion, C	Ariz.	3,000,000	300,000	10	.....	.....	.....	.....	
91	Oriental	Nev..	2,000,000	200,000	10	.....	.....	.....	.....	
92	Oriental & Miller, S.	Nev..	10,000,000	400,000	25	.....	.....	.....	.....	
93	Overman, G. S	Nev..	11,520,000	115,200	100	3,685,040	Apl.	1885	.20	
94	Parrott, C	Mon.	1,800,000	180,000	10	.....	.....	.....	.....	
95	Park, S	Utah	2,000,000	200,000	10	.....	.....	.....	.....	
96	Peer, S	Ariz	10,000,000	100,000	100	125,000	Apl.	1886	.10	
97	Peerless, S	Ariz.	10,000,000	100,000	100	275,000	May	1886	.50	
98	Potosi	Nev..	10,200,000	112,000	100

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.
	May 15.		May 17.		May 18.		May 19.		May 20.		May 21.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon.													
Amie Con., Co.	.03								.04	.03	.03		5,600
Argenta	.16												300
Bassick, Co.													
Belle Isle, Ne.	.18								.10				600
Bodie Cons., Ca.	1.75	1.70	1.85	1.70	1.80	1.75			1.75		1 75		3,750
Breece													
Bulwer, Ca.	2.25	2.10	2.45	2.00	2.05	2.00	2.00	1 95			2.15	2.10	7,875
Cal., B. H.													
Challar													
Chrysolite, Co.			.60	.55					.59				900
Colorado Central													
Cons. Cal. & Va., Ne.	1 40		1.55	1.40	1.55	1.50			1.55		1.55		6,400
Crown Point													
Deadwood Terra											2.05	2 00	150
Eureka Cons., Ne.					1.40				2 45		2.50	2.45	950
Father de Smet, Dk.	.85												200
Freeland													
Gold Stripe, Ca.													
Gould & Curry, Ne.													
Grand Prize, Ne.	.65												200
Green Mountain, Ca.											.30		100
Hale & Norcross, Ne.			2.35	2.00	2.80	2.50			2.50		2.45		2,150
Hall-Anderson, N. S													
Homestake, Dk.									21.25	20.00	19.50		180
Horn-Silver, Ut.							2.60	2.50	2 65		2 75	2.65	1,850
Independence, Ne.													
Iron Silver, Co.													
Leadville C., Co.													
Little Chief, Co.							.21		.22		.25	.24	2,300
Little Pittsburg, Co.													
Martin White, Ne.													
Moulton													
Navajo, Ne.									.95	.90	1.00	.95	1,000
North Belle Isle, Ne.									.25				100
Ontario, Ut					29.00								200
Ophir													
Osceola													
Potosi													
Quicksilver Pref., Ca.			20.00	19.88									200
" Com., Ca.													
Quincy													
Robinson Cons., Co.													
Savage, Ne.	1 05		1.10		1.25	1.20							900
Sierra Nevada, Ne.	.50								.62	.58	.60		900
Silver King, Ar.					7.50		8.00		7.88				300
Spring Valley, Ca.													
Standard, Ca.	1.05						1.20						300
Stormont, Ut.			.15				15				.14		1,700
Tip Top, Ar.													
Yellow Jacket	.90								1.05		1.10		450

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES
	May 15.		May 17.		May 18.		May 19.		May 20.		May 21.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Albion													
Alta													
American Flag	.08		.08								.08		3,500
Barcelona, G.													2,000
Bechtel Con., G.											.08		
Belvidere													
Belcher													
Best & B'lcher, G. S.													
Big Pittsburg, S. L.													
Bowman Silver													
Bull-Domingo, S.L.													
Central Ariz'na, S.													
Challar													
Cons. Imperial			.08										900
Con. Pacific	.60	.40									.50		400
Cusi													
Decatur													
Durango, G.													
Eastern Oregon													
Goodshaw, G.			.16										1,200
Harlem M. & M. Co.													
Harshaw													
Kossuth													
Lacrosse, G.	.09		.09										5,000
Mariposa Pref., G.													
" Com., G.													
Mexican, G. S.			1.45										100
Mono	2.55												100
New Pittsburg													
North Standard, G.													
N. Horn-Silv'r, S L.													
Pri'nt'l & Miller, S													
Plutus													
Potosi													
Rappahannock, G	.13								.12		.13		3,700
Red Elephant, S.													
Ridge													
Silver Cliff, S.	.05												1,500
Sonora Con.													
South Bodie, G													
South Bulwer, G.													
South Hite													
South Pacific													
State Line, 1 & 4, S.													
" Nos. 2 & 3, S.													
Sutro Tunnel	.12		.12						.12	.11	.11		14,200
Tamarack													
Tioga			.20		.20								300
Unadilla, S													
Union Cons., G. S.	.55												200
Utah													

Dividend shares sold, 39,555. Non-dividend shares sold, 33,100.

panies to give employment during the remainder of the year.

Of course, the Cumberland companies will for some time have their hands full in meeting the demands made by those to whom they have contracted to deliver coal, and from this cause there is but little if any coal obtainable for instant delivery; but for shipment in the next two to four weeks, $2.25 f. o. b. Baltimore, and $3.25 alongside here, is asked. Clearfield coal, which held at $3.50@$3.60 f. o. b. here last week, has been offered this week at $3.20 alongside, a reduction of quite 50 cents a ton. The poorer coals are doing but little business, and are likely to rule very low soon.

About 120 new men sent from here to the mines of the Berwind-White Coal Mining Company are at work. Five of the strikers have also joined them.

Buffalo. May 20.

[From our Special Correspondent.]

The anthracite coal trade continues in good shape, according to the report of dealers. But few orders have been given as yet for house purposes. The trade say that there is nothing significant in the fact. It is said that a cut of 25 cents a ton has been made in large orders—say of 30 tons and upward—on all sizes except pea. If this is true, presumably our local exchange is cognizant of the fact, and allows the concession; for the party or parties making such a departure from the schedule rates could easily be discovered if the coal is to be delivered promptly.

The bituminous coal trade remains in the same condition. "We are getting plenty of coal," says a mine owner and dealer to-day, "for all our uses; there is no glut in the market, our business is done in half the time it formerly took; as soon as the coal comes in, it is unloaded and the cars are sent back, therefore there is no block at the yards for days and weeks, as used to be the case." Coke is steady, with fair average trade for local requirements and near-by points. The reports from the owners state that there is a steady market for the product, at $1.50 a ton, with no accumulation.

The question of the quality, consumption, and price of gas is now exciting considerable attention in business circles. The following figures show the increase in the cost of lighting the streets and public buildings of our city for the years named:

Year.	Cost.	Year.	Cost.
1870	$96,509.23	1882	$166,366.81
1875	125,468.62	1883	177,260.12
1880	128,914.26	1884	202,643.02
1881	170,885.41	1885	251,143.40

Police and Water Departments not included in 1870 and 1875. Water Department not included in the other years.

I saw a paragraph the other day, from which it appeared that 264,000,000 cubic feet of natural gas are wasted daily in Pennsylvania, and further, that the labor of 3800 miners would be required to produce its equivalent in coal.

The Merchants' Exchange has appropriated the sum of $4000 a year to establish a freight bureau, with a competent manager, familiar with all the intricacies of the transportation problem. Mr. A. H. Snider, of Columbus, Ohio, has been appointed the manager, and will enter upon his duties June 1st next. All persons interested in coal freights, members of the Exchange, will do well to lay their grievances before the Transportation Committee, which will receive careful consideration, and means be adopted to ascertain the why and wherefore of the trouble and endeavors be made to have the evils remedied.

The New York Central contracts for bituminous coal for the year ending May, 1887, have been made, if reports are to be believed. The most reliable statement is to the effect that 400,000 tons were bought of Buffalo parties, of which Messrs. Thomas Loomis secured 200,000 tons, Messrs. J. Langdon & Co. 100,000 tons, and Messrs. Bell, Lewis & Yates 100,000 tons. No indication of prices was manifested in any way except that very low figures prevailed.

Coal shippers and carriers agreed to terms last week, and since then there has not been any trouble in shipping. Many vessel owners, however, sent their craft up light in preference to waiting their turn for a load at the chutes.

The receipts of coal by canal from May 1st to 14th were 3484 tons; the shipments from May 7th to 14th, 246 tons.

The coal shipments by lake from May 13th to 19th, both days inclusive, aggregated 38,500 tons; namely, 20,890 to Chicago, 9220 to Milwaukee, 9580 to Duluth, 700 to Detroit, 800 to Green Bay, 2550 to Toledo, 580 to Sandusky, 1360 to Racine, and 2500 to Sheboygan. The grand total for the season, 199,710 tons. The engagements and rates reported were, for net tons, as follows: 60c. to Chicago and Milwaukee, 65c. to Sheboygan and Racine, 50c. to Green Bay, 40c. to Lake Superior ports, 40c. to Duluth and on contract, and 25c. to Toledo, Detroit, and Saginaw. Vessels in fair supply at the close.

The only engagements of coal by canal for the week ended May 19th were: One boat-load to Troy, at $1.25 net ton, captain to pay loading and unloading; one boat-load to Ithaca, 80c. net, captain to pay unloading only; and one boat-load to Syracuse, 65c. net, captain to pay unloading only. The nominal asking rate to New York is $1.50, and to Albany and Troy $1.25 per gross ton, free in and out.

Receipts of coal by lake at this port this season to date, 276 tons from Cleveland. Receipts of coal at Duluth from opening of navigation to May 15th, 7336 tons.

Boston. May 19.

[From our Special Correspondent.]

The market continues quiet and inclined to weakness in anthracite coal. Sales of stove coal are made at considerably less than nominal asking figures. Broken and egg are also less firm than they have been, but pea coal is so well sold up as to be strongly held, and there is beginning to be some demand for buckwheat coal. There is less buoyancy to the market than when I last wrote, but, considering the dullness, prices are held fairly well. F. o. b. prices will be found in the New York market report.

The demand for bituminous coal is not so large as it has been, but high prices continue to be realized for the comparatively small amount along. We hear of sales at $4.50 delivered for Clearfield, and $4.75@$5 for Myersdale. Dealers claim that the latter is better for blacksmithing. There has been a considerable demand from blacksmiths, and we hear of small lots sold at retail at $6.50@$7 a ton. Quite a quantity of Nova Scotia coal is coming along at $4.10@$4.25 for run of mine, and $2.75 for culm; in each case, delivered and duty paid. A number of large consumers in this market have been recent buyers of Nova Scotia coal, including some of the railroads and sugar refineries. The feeling is very general that the miners must soon give in; but while a few look for a speedy settlement, the advices of most jobbers incline them to expect further delay.

There is no change in freights to notice. We quote rates exclusive of discharging:

New York, 85@90c.; Philadelphia, $1.05; Baltimore, $1.10@$1.15; Newport News, $1.05@$1.10; Richmond, $1.25; Cape Breton, $1.85@$2; Bay of Fundy, $1.60.

There is an unsettled feeling in the retail trade, but the importance of the recent disturbance in prices was

probably exaggerated, as indicative of the feeling of the Lackawanna and Reading or any other of the shipping companies. There is, and has been for a long time, in Boston, an inharmonious state of affairs among the larger retail dealers, and it is bound to continue until the fittest survive. So far as I can learn, the movement of last week was essentially one of these internal and local outbreaks. Prices of Broken and Egg were quoted at $4.50 and $5 respectively; then $4.25 and $4.75; then at $4 and $4.40; and finally, at $4.50 and $5, which is the present price, although the dealers who are not actively concerned in the petty warfares of the trade are still asking $4.75 and $5.25. There is a rather light trade.

Pittsburg. May 20.

[From our Special Correspondent.]

We have nothing particular to note. The May shipments from the 9th to 16th foot up: Cincinnati, 4,473,000 bushels; Louisville, 6,971,000 bushels; total, 11,444,000 bushels. At present, the Ohio River is too low for navigable purposes. There will be no further exports until we have a rise. The above runs gave business to 71 tow-boats. There is still plenty of coal in the pools that will be shipped as soon as the water will permit.

Prices on board boats, 4@5c. a bushel; railroad, 4¼@4¾c. a bushel.

Connellsville Coke.—The market is steady at the advance, namely: Blast-Furnace, $1.50 f. o. b. at ovens; Foundry, $1.75; Crushed, $2.25. Of the 10,832 ovens in this region, there are 451 idle. Shipments are slowly increasing in all directions, the aggregate output for the week being 950 cars, of which the syndicate shipped 700 cars, and the outside producers 250. There is at present a legitimate demand for 1000 cars daily. The April shipments were 22,000 cars.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, May 21.

A more animated feeling has been displayed in the business of mining stocks. The dealings, however, have not increased greatly, but have been well distributed throughout the list. Prices were firm. The total transactions were 72,655 shares, an increase of 12,960 shares, as compared with those of the preceding week.

To the successful starting of the new furnace, and the reported good prospects of the mines of the Eureka Consolidated Mining Company, is probably due the advance in the stock, which went from $1.40@$2.50. Navajo, which has shown an upward movement during the past few weeks, continues in the same position, and went from 90c.@$1, with sales of 1000 shares. Belle Isle declined from 18@10c. Grand Prize sold at 65c. North Belle Isle, at 25c. Among the Comstocks, Sutro Tunnel, as usual, shows a large business, and sold at from 12@11c. Consolidated California & Virginia was firm at from $1.40@$1.55. In another column, we give the statement issued for the past month. Hale & Norcross advanced from $2@$2.80, closing at $2.45. Yellow Jacket, from 90c.@$1.10. Savage from $1.05@$1.25. Sierra Nevada, from 50@62c. Consolidated Imperial, which has not been dealt in for a long time, shows a sale of 900 shares at 8c. a share.

Bulwer Consolidated has again been very active, and prices ranged from $2.45@$1.95, closing at $2.10. Bodie has been lower, as compared with last week, selling at from $1.70@$1.85. Mono, at $2.55. Standard, at from $1.05@$1.20. Goodshaw has again appeared, with sales at 16c. Tioga, at 20c. Plymouth Consolidated, which has apparently for the present dropped entirely from the list, has just declared its usual monthly dividend of $25,000, making a total to date of $1,675,000.

The Colorado stocks are without special features. Chrysolite sold from 60@55c. Amie, at 3c. and 4c. Little Chief, at from 21@25c. Lacrosse, at 9c.

The Ontario Silver Mining Company will soon distribute another $75,000 dividend among its stockholders. It holds its own at $29, at which a sale of 200 shares was made. Horn-Silver has been more active, selling at higher prices, from $2.50@$2.75. Stormont shows sales of 1700 shares, at 14 and 15c.

During April, Father de Smet produced no bullion, and the price, which is now but 85c., will go still lower if this month shows no better prospects. Homestake comes with another dividend of $50,000, but notwithstanding, the price went from $21.25@$19.50. Silver

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share.												Sales from May 15th to May 21st, inclusive.
		May 15.		May 17.		May 18.		May 19.		May 20.		May 21.		
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	50	18¾	.....	18⅞	18¾	18⅝	18½	18⅞	18¼	17¾	.....	19	18	3,527
Col. C. & I	10	22¾	.....	22⅛	22	.....	.....	22½	22¼	23	.....	22⅞	.....	850
Ches. & O. RR	100	8	.....	.....	.....	.....	.....	7⅞	7½	.....	.....	.....	.....	223
Consol. Coal	100	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	.....	.....	25
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	96¾	96	97⅛	96¾	97	95¾	96	95	98¾	95⅝	97⅜	96⅛	9,923
D., L. & W. RR	50	126¼	125⅜	126⅝	126	126⅛	125⅝	125⅝	125	126⅝	125⅛	126¾	126⅛	111,695
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh C. & N.†	50	51⅛	50¾	.....	.....	50¾	.....	50¾	50½	50½	.....	.....	.....	828
Lehigh Valley RR.†	50	56½	.....	.....	.....	56½	.....	56½	.....	57⅛	57	.....	.....	174
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	100
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Central Coal	100	.....	.....	.....	.....	11	.....	.....	.....	11	.....	.....	.....	125
N. J. C. RR.	100	50⅜	49¼	50⅜	50⅜	50⅜	49⅞	50¾	49⅝	51⅞	50⅜	52	51¼	40,310
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	51⅝	51½	....	.....	51¾	51½	51⅝	51⅜	51⅝	51⅜	.....	.....	4,219
Ph. & R. RR.*	50	22½	22⅜	23	22½	22½	22	22⅜	21⅞	22½	21⅝	23	22½	9,950
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westmoreland Coal†	50	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Of the sales of this stock, 5,060 were in Philadelphia, and 4,890 in New York.
The quotations for these stocks are not percentage, but actual price. Total sales, 181,949.

King remained at from $7.50@$8. Rappahannock, 12@13c.

It is stated that the Stockholders' Committee of the Hibernia Consolidated Mining Company has notified the stockholders to deposit their certificates of stock with the Mutual Trust Company, No. 39 Broadway. Many owners of the stock had long thought that efforts for the recovery of their property had been abandoned; but the legal proceedings which have been continued seem to show a chance of realizing something. The expenses for the proceedings have been paid by voluntary contributions of the stockholders. The company is said to have over $5000 on deposit with the Central Trust Company.

The Governing Committee of the Philadelphia Petroleum and Mining Exchange has decided to list all the active stocks dealt in at New York, and to change the name to the Philadelphia Petroleum and Stock Exchange. The American Loan and Trust Company, of New York, will act as the transfer-agent of the Exchange.

The following securities were sold at auction in this city on the 20th inst.: 175 shares Pennsylvania Coal Company, 260; 24 shares Minnesota Mining Company, $1.

Coal Stocks.

The business at the Stock Exchange during the past week has been small, but prices have been firm with a rising tendency. In fact, during the past two days there has been a large increase in the bullish feeling. The basis for this is encouraging crop reports, large railroad construction, increasing confidence, and prospects of a greatly improved general business in the fall. The coal stocks are a little higher than a week ago, in the face of a temporarily worse condition of affairs in the coal trade. This, however, is due to an under-current of belief that something of a favorable character to the coal properties, as a group, will soon be developed by the people who are trying to accomplish the reorganization of Reading. There is no question that the accomplishment of this result will remove a very disturbing element in the trade.

The dealings in Delaware, Lackawanna & Western aggregate 111,695 shares at $125@$126¾, closing at $126½. The transactions in Delaware & Hudson amount to 9923 shares, at $95@$97⅝, closing at $97¼. Jersey Central was dealt in to the extent of 40,310 shares, at $49¼@$52, closing at $51½. Reading ranged between $21⅝@$23, and closed at $22¾, with transactions of 4890 shares.

The Tremont Coal Company first mortgage bonds, which mature June 1st, will be extended for twenty years at five per cent interest. The Real Estate Trust Company of Philadelphia gives notice that it will extend these bonds upon presentation; will pay the coupon maturing June 1st on and after that date; and will also purchase at par the bonds of holders declining to extend them.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Amygdaloid Mining Company, office of M. H. Hoffman, No. 629 Walnut street, Room 7, Philadelphia, Pa., June 2d, at twelve o'clock M.

Beaufort Iron Company, Ishpeming, Mich., June 1st, at half-past three o'clock P.M.

Cleveland Iron Mining Company, Cleveland, Ohio, May 26th, at eleven o'clock A.M.

Empire Copper Company, office of M H. Hoffman, No. 629 Walnut street, Room 7, Philadelphia, Pa., June 4th, at twelve o'clock M.

John Duncan Land and Mining Company, Hancock, Mich., June 7th, at two o'clock P.M.

Kearsarge Mining Company, No. 69 Devonshire street, Room 20, Boston, Mass., June 11th, at twelve o'clock M., special meeting to consider the question of increasing the capital stock to $1,250,000, and the number of shares to 50,000.

Lake Superior Iron Company, No. 37 Franklin street, Boston, Mass., June 16th, at twelve o'clock M.

New Jersey Iron Mining Company, Dover, New Jersey, May 26th, at two o'clock P.M.

Ogden Iron Company, Dover, New Jersey, May 26th, at three o'clock P.M.

Quincy Mining Company, No. 2 Exchange Court, Room 70, New York City, June 2d, at twelve o'clock M.

St. Joseph Lead Company, No. 55 Liberty street, New York City, June 14th, at one o'clock P.M., special meeting to determine whether the capital stock shall be increased from $1,100,000 to $1,500,000, to consist of 150,000 shares of the par value of $10 a share.

Titan Iron Company, Ishpeming, Mich., June 1st, at four o'clock P.M.

Dividends.

Colorado Central Consolidated Mining Company, of Colorado, has declared dividend No. 8 of five cents a share, or $13,750, payable June 10th, at the Farmers' Loan and Trust Company of this city.

Homestake Mining Company, of Dakota, has declared dividend No. 49 of forty cents a share, or $50,000, payable May 25th, at the office of Messrs. Lounsbery & Co., No. 15 Broad street, New York City.

Leadville Consolidated Mining Company, of Colorado, has declared dividend No. 12 of five cents a share, or $20,000, payable May 18th, at the company's office, No. 1 Broadway, Room 213, New York City.

Ontario Silver Mining Company, of Utah, has declared dividend No. 120 of fifty cents a share, or $75,000, payable May 29th, at the office of Messrs. Lounsbery & Co., No. 15 Broad street, New York City.

Philadelphia Company (Natural Gas) has declared a dividend of one per cent, payable May 20th, at the company's office, Pittsburg, Pa.

Plymouth Consolidated Gold Mining Company, of California, has declared dividend No. 37, of twenty-five cents a share, or $25,000, payable June 5th, at the company's office, No. 23 Nassau street, New York City.

Small Hopes Consolidated Mining Company, of Colorado, has declared dividend No. 41 of twenty-five cents a share, or $62,500, payable May 22d.